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A National Newspaper for Every Branch of the Industry

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NOV 5 - 1931
DETROIT

Automotive Daily News

CARS · SHOP EQUIPMENT · TRUCKS · AVIATION · PARTS · ACCESSORIES · TIRES

Vol. 12. No. 1591. Entered as second-class matter Aug 27 1925 Post Office, N. Y. N. Y., Under Act of March 3 1879 NEW YORK, TUESDAY, NOVEMBER 3, 1931 5 Cents. $12 Per Year

Hanch Calls on Bankers To Aid Move to Permit Rediscounting Time Paper

Says Movement Would Release Over a Billion and A Quarter Worth of Frozen Credit

CHICAGO, Nov. 2.—A move to enlist the support of prominent bankers from all sections of the country in a plan to release a billion and a quarter dollars worth of credit by making finance company paper eligible to rediscount at Federal Reserve Banks was announced today by C. C. Hanch, general manager of the National Association of Finance Companies.

Mr. Hanch has asked more than 1,000 finance companies to enlist the support of the banks with whom they do business for the petition now pending before the Federal Reserve Board, to make the notes of banks and of finance and credit companies, drawn for the purpose of procuring funds for the purchase of installment paper, eligible for rediscount at the Federal Reserve banks.

"Besides increasing the amount of eligible paper, which the banks sorely need, our plan would have the desirable result of decreasing finance charges and thereby stimulating the purchase of installment goods," said Mr. Hanch. "This would be an important contribution toward the return of prosperity.

"It is important to make this paper eligible in the case of an emer-

(Continued on Page 2)

DODGE DEVELOPS NEW NON-BURNING VALVE SEAT INSERT

Detroit, Nov. 2.—A valve seat insert of high-speed tool steel has been developed by Dodge Brothers' engineers, which, it is claimed, completely and positively eliminates eroding and burning exhaust valves, thus solving a problem that has baffled the best engineering minds of the motor industry for years.

Tests and experiments have been underway in the Dodge laboratories for almost twelve months and thousands of dollars have been expended in research, motors and materials.

The importance of this discovery is made clearer when it is understood that the proper functioning of the exhaust valves is the determining factor in the life of a gasoline engine, particularly in the field of truck, bus, marine and airplane operation. Faulty valves result in a lack of power, mis-firing, over-

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STEEL PLANTS GAIN SLIGHTLY ON CAR ORDERS

Youngstown, O., Nov. 2.—Further small expansion of steel plant operations in the Youngstown district this week encouraged steel company executives to hope that the turn in

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Passenger Car Sales for 1931 Estimated 1,889,627 Vehicles

First Nine Months This Year Ran 27.8% Under Same Period 1930; Commercial Cars Hold Firmer

DETROIT, Nov. 2.—With final figures for September passenger car sales, which appeared in a former issue of Automotive Daily News with the nine months makes and states compilation, the first time this was published anywhere, released by R. L. Polk & Co., it is possible to get a fairly definite idea of total registrations for the year.

The September sales total stands at 124,903 units, which compares with 175,286 in September, 1930. The sales total for the first nine months of this year is 1,652,089 units comparing wth 2,286,729 for the same period of 1930. This is a decrease of 27.8 per cent. During the final three months of 1930 the sales total was 339,339 passenger units. Allowing for a decrease of 30 per cent. a shade above the drop registered during the first nine months from this level during the final three months of 1931, we get a passenger car sales total for the final quarter of 237,538.

With this estimate simple addition gives us 1,889,627 as the passenger sales total to 1931, and the chances are that this is a close approximation of what the final figure will prove to be. It compares with 2,626,068 passenger cars sold in the domestic market during 1930.

Some interesting tendencies in the distribution of passenger car sales in the various territorial zones are analyzed by the R. L. Polk organization. In the main it will be noted

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CHRYSLER APPOINTS FARGO DIVISION REGIONAL MANAGERS

Detroit, Nov. 2.—Completing the formation of a field organization of trained sales and service representatives, R. L. Biggers, vice-prsident in charge of field activities of the new Chrysler Motors Fargo Division, today announced the oppointment of nine regional managers.

The me ad the regions which they will serve are: F. T. Jackson, Atlanta; R. A. Nash, Boston; W. L. Schweninger, Chicago; W. W. Jolly, Dallas; D. C. McCallum, Detroit; N. W. Seidel, Kansas City; H. D. Carson, New York; P. W. Gaebellein, Stockton, Cal.; and R. H. O'Brien, Washington, D. C.

The Chrysler Motors Fargo Division will handle factory fleet sales of all products built by the various units of the Chrysler Corporation, Fargo motor coaches, Dodge trucks, Dodge, De Soto, Chrysler and Plymouth passenger cars. In addition to sales representatives, the field organization includes a number of advisory maintenance men who will assist fleet owners in solving their service problems.

CONG. CLANCY SEES LITTLE LIKELIHOOD OF MOTOR TAXES

Detroit, Nov. 2.—Prediction was made by Congressman R. H. Clancy of Michigan at the testimonial dinner given William S. Gilbreath by the Michigan Good Roads Association, that there will be no sales tax on automobiles, despite the rumblings from Washington that such a tax is being given consideration by the administration.

Congressman Clancy stated flatfooted that such a measure had little or no chance of getting through either the House or the Senate; that a powerful organization to combat it has been built up and that a defeat of such a proposition is assured.

Continuing, the congressman stated: "These same interests obtained the gift of $300,000,000 from the Federal government for good roads. They had approximately $206,000,000 in taxes on the motor industry canceled when automobile values were good. They will be able to spare the industry the burden of an additional tax under present conditions."

EMPLOYMENT GAIN IN NEW JERSEY; PAY ROLLS DROP

Newark, N. J., Nov. 2.—Employment in 774 of the largest industrial plants of New Jersey improved three-tenth of one per cent. in the month ending September 15, last, as compared to the previous month. This was reported today to Colonel Charles R. Blunt, state commissioner

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OAKLAND PLANTS TO GET UNDER WAY AGAIN THIS MONTH

Pontiac, Nov. 2.—Oakland Motor Car Company will resume production during November, following a brief shut-down for inventory and installation of new machinery. The foundry will open the week of November 9, it was announced from the office of C. B. Stiffler, assistant to the president, today.

The motor plant and the sheet metal plant will open the week of November 16, while the automobile assembly plant will begin operations the week of November 23. Production on new models, which are to be announced in January, will begin during the month.

L. A. MILLER SEES INDUSTRY LEADING WAY TO RECOVERY

TOLEDO, Nov. 2.—That the automobile industry will lead the way to general recovery of business, through harmonious policies and concerted action, utilizing its vast resources for advertising and other sales effort, is the opinion expressed by L. A. Miller, president of the Willys-Overland Company, over a twenty-six-station coast-to-coast radio network.

"There are daily evidences of growing confidence in American business," Mr. Miller told his unseen audience, "and it seems to me that so little is required to insure a dramatic recovery. For two years, limited consumption has exceeded restricted production; our needs are mounting; our shelves are empty, while our resources are tremendous.

"Taking advantage of today's market will lay the foundation of tomorrow's wealth, but faith is required. I firmly believe that the automobile industry will lead the way, by harmonious policies and concerted action, utilizing its vast resources for advertising and other sales effort.

"Following the sound advice of President Hoover's Committee on Unemployment Relief, as we approach Thanksgiving we should manifest by word and deed our deep interest in those who are suffering. In addition, we should determine to banish fear from our minds, substituting therefor a supreme confidence in the future of American business and in our leaders as well. Thanksgiving in 1931, with sympathy and confidence, should prove to be our most fruitful season."

At the conclusion of his radio address, Mr. Miller congratulated the first four winners of Willys Sixs. awarded in Willys-Overland's national advertising slogan contest. Eight more cars are yet to be awarded.

Dealer Tire Stocks Oct. 1 On Par With Last Year

WASHINGTON, Nov. 2.—**Stocks of casings and tires held by independent dealers on October 1 are practically unchanged compared with stocks of a year ago, according to a survey just published by the rubber division of the Bureau of Foreign and Domestic Commerce.**

But mass distributors' stocks of casings and inner tubes were somewhat greater on October 1 than on April 1, while a pronounced increase is noted over October 1, 1930.

The number of retail outlets, including those used by mass distributors with the independent retailers is believed to be greater now than a year ago.

The average number of automobile casings per independent dealer was 60.2 on October 1, 1931, as compared to 62.4 a year previous. Since a limited number of dealers treated under the present report as mass distributors were included in the 1930 report as independent dealers, it is believed that the stocks of independent dealers are now practically unchanged from those of a year ago.

Stocks of inner tubes and solid tires averaged definitely lower than in 1930, indicating a reduction during the past year in dealers' stocks of these items.

The total number of casings on hand in independent dealers' stocks on October 1 was 1,617,366, as compared with 1,965,728 a year ago. This discrepancy is accounted for by the fact that 4,640 less dealers reported this year than last.

The number of high-pressure casings carried by the average dealer was 11.3, as compared with 14.5 a year ago. Average stocks of inner

(Continued on Page 10)

Late News Flashes

Cleveland, O., Nov. 2.—In its current issue the magazine Steel says that gradual but unmistakable progress is being made in restoration of confidence in the steel industry, though actual operations show a gain of only about 2 per cent. to 30 per cent. of capacity.

* * *

Los Angeles, Cal., Nov. 2.—Daily production of crude oil in the California field averaged 494,200 barrels, off 12,800 barrels from the previous week.

* * *

New Haven, Conn., Nov. 2.—Prof. Irving Fisher's index of wholesale prices stood at 68.5 for the second week. For the first week in October the index registered 68.1. The relative stability of the index has been considered a favorable sign by economists.

President Hoover Greets Engineers

PRESIDENT HOOVER receives transportation members of the Society of Automotive Engineers, in session in Washington last week. From left to right, they are: Robert S. Burnett, Society of Automotive Engineers, New York city; F. C. Horner, General Motors Truck Company, New York city; William P. McCracken, Jr., Washington; Harry Horning, Waukesha Motor Company, Waukesha, Wis.; A. S. McArthur, Toronto Transportation Commission, Toronto, Canada; F. K. Glynn, American Telephone and Telegraph Company, New York city; President Hoover; L. R. Bauckendale, Timken-Detroit Axle Company, Detroit Mich.; A. J. Scaife, White Motor Company, Cleveland, O.; John A. C. Warner, general manager of the Society of Automotive Engineers; C. A. Pooley, C. & P. Telephone Company, Baltimore, M. D.; J. W. Cottrell, Chilton-Class Journal Publishing Company, Philadelphia, Pa.

Hanch Urges Bankers to Rediscount Movement

(Continued From Page 1)

gency and thus improve the whole banking structure of the nation. Less than 10 per cent. of the paper now eligible is actually rediscounted, but the banks need all they have and a great deal more as a reserve quickly convertible into cash in case of need. Our plan for broadening the basis, we believe, is strictly in line with President Hoover's announcement of October 7, in which he said he would propose to Congress the broadening of the eligibility provisions of the Federal Reserve act in order to give greater liquidity to bank assets in time of stress.

"It is the opinion of many competent lawyers that the board has full authority under the law to make the notes of finance companies eligible immediately without waiting for Congressional action. If the board should decide that Congressional action is necessary, or takes no action before Congresse onvenes, we expect to put our plan for increasing the financial liquidity of the nation before Congress at the first opportunity."

CHANGES FIRM NAME

New York, Nov. 2.—The firm name of the Graham-Paige distributor in New York has again been changed to C. H. Jennings Corporation, 1877 Broadway at 62d Street.

DODGE DEVELOPS NEW NON-BURNING VALVE SEAT INSERT

(Continued from Page 1)

heating and carburetor trouble, since a riding exhaust valve will get so hot that it will cause the incoming gas to explode and blow back into the carburetor.

The new valve seat, as developed by Dodge Brothers, in combination with an exhaust valve of non-burning, non-oxidizing and non-warping steeel and a valve stem guide of high nickel cast-iron, will give upward of 50,000 miles of service without any valve adjustments or valve grinding and an exhaust valve life probably as great as the cylinder block itself.

In making their tests, Dodge engineers experimented with numerous different alloys, using 30 separate engines which were operated at wide open throttle and under full load for a combined total of 6,070 hours. Belief that they have solved the problems is based on the fact that the high-speed tool steel insert showed not the slightest tendency to break down, erode or require any grinding at the conclusion of 1,217 hours' steady running on the testing block.

The insert is composed of tungsten, chromium, vanadium and carbon and is four-thousandths of an inch larger than the exhaust valve opening in the cylinder block into which it is pressed by a special machine. In addition to pressing the insert into the valve opening, this machine also turns down the metal of the block around the edge of the insert permanently sealing it in place.

In perfecting this insert, it was necessary to develop a combination of alloys that would have the same co-efficient of expansion as the cast iron of the cylinder block, so that, as the block expanded and contracted at varying temperatures, the insert would expand and contract to the same degree.

SPARKS from DETROIT

Graham Honors Rockne

* * *

Clayden Comes Home

* * *

I'm Sorry

* * *

A Parking Gamble

* * *

Meat on the Table

Chris Sinsabaugh—Detroit Editor

SELECTION of Rockne for the name of the new car that is to be launched for 1932 by the named company of which George M. Graham is the accredited representative at the present time is the automobile industry's tribute to the memory of the late Notre Dame football coach.

Knute Rockne, while he was the gridiron's most outstanding figure at the time of his death, was essentially an automobile merchandiser. Had he lived he undoubtedly would have made a reputation in this business of ours as one of its great executives. He was away to a brilliant start in his climb to the automobile heights—a man who knew sales management as it applies to the merchandising of motor cars and who could talk to dealers in a language they understood.

It will be another fortnight before Mr. Graham takes the public into his confidence and announces the make-up of the company and its personnel. Maybe then we will understand the reason for the selection of the name Rockne for the new low-priced addition to our family. In the meantime, we can only read between the lines and make our own guesses as to who is sponsoring the project.

* * *

A. LUDLOW CLAYDEN, research engineer of Sun Oil, is a Detroiter again, having been assigned here by the company. Time was when Clayden's main activities were centered in Detroit. That was when he was technical editor of Class Journal and before his Sun Oil connection.

Clayden brings with him a recent purchase. Don't laugh when I tell you it is a 1907 Rolls-Royce, but you know an engineer always wants to be taking things apart and finding what makes the wheels go around. That explains the old boat. But what intrigued me was the distinguished history of this particular old car, which in its time has been driven more than a quarter million miles.

J. G. Perrin, then Lozier engineer, bought the Rolls-Royce for experimental purposes when he was designing the first Lozier. He sold it to T. W. Eaton, the John Wanamaker of Canada, who in turn presented it to his son-in-law, Col. Bishop, Canada's aviation war ace. Then it went to Warren Hastings, a prominent Canadian motorist.

The old car is a six with a wheelbase of 154 inches and although it does not have its original body, yet it contains almost all its original parts. Clayden has changed the carburetion and ignition and is playing around with it as any research engineer naturally would do. One thing he has noticed is the difference between four-wheel brakes and the old type. And now he appreciates modern practice.

* * *

MY error; I'm sorry, by which I mean that when I wrote the story about Stewart-Warner's celebrating their twenty-fifth anniversary I overlooked mentioning that the North East speedometer was in the same competitive field with Stewart-Warner, AC and Waltham. My wits must

(Continued on Page 10)

DURING the first half of October, Willys-Overland's orders for immediate shipment of cars and trucks exceeded the first half of September by more than 50%. October's total was 95% ahead of last October. Here is definite proof that the buying public will always respond to outstanding values.

Write or wire for particulars of this profit-building franchise

WILLYS-OVERLAND, INC.
TOLEDO, OHIO
Willys-Overland, Ltd., Toronto, Canada

WILLYS SIXES AND EIGHTS
WILLYS-KNIGHTS
WILLYS SIX TRUCKS

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Cadillac V-12
Cadillac V-16
Chrysler 8
Chrysler 8 De Luxe
Chrysler Imperial 8
Continental Motors
De Soto 6
De Soto 8
De Vaux 6-75
Dodge Bros. 6
Dodge Bros. 8
Durant 6 (614)
Durant 6 (617)
Essex 6
Hudson 8
Hupmobile 8 (C-100)
Hupmobile 8 (H-133)
Hupmobile 8 (U-133)
Hupmobile Century 8
La Salle 8
Lincoln 8
Oakland V-8

A manufacturer of high grade eights (Name on request)

Peerless 8 (Model B)
Peerless 8 (Model C)
Pontiac 6
Reo Flying Cloud 6
Reo Flying Cloud 8
Reo Royale 8

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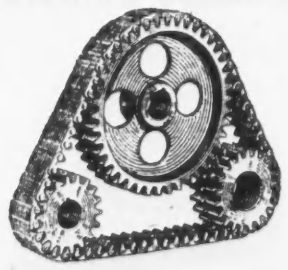

ROCKNE SIX PRICED BETWEEN $600-$700

Detroit, Nov. 2.—George Graham announced today that his new car, the Rockne Six, will carry a base price of between $600 and $700. It had been rumored that this newcomer in the field would be placed in the $500 division. A complete body line will be offered on the Rockne chassis.

It is understood that the name of the company which is sponsoring the development of the Rockne line will be announced within a short time.

PROBECK HEADS SALES FOR FEDERAL WELDER

Warren, O., Nov. 2.—The Federal Machine and Welder Company, manufacturer of welding equipment, announces the appointment of A. A. Probeck as sales manager.

CLASSIFIED ADVERTISEMENTS IN THE AUTOMOTIVE DAILY NEWS BRING RESULTS

What the Standards Bureau Is Doing for Business

The following paper was presented at the Wednesday session of the national transportation meeting of the Society of Automotive Engineers at the Shoreham Hotel, Washington, D. C., last week. It is appearing serially in Automotive Daily News.

By G. K. BURGESS,
Director National Bureau of Standards, Washington, D. C.

Not only is national business dependent upon a centralized system of weights and measures, but international trade also must have uniformity. For this reason the bureau maintains the closest possible relationship with the similar organizations in foreign countries, whereby commodities weighed or measured here in yards, feet or pounds can be checked accurately in any other country in meters or kilograms, or whatever system is there used.

In recent years this international co-operation has been extended to standards of interest to other industries. There is now established an international temperature scale and questions relating to heat units are in the process of adjustment. The electrical units are also being revised through international agreement as well as the standards of light on which our illumination practices are based. International agreement on the X-ray standard of dosage is at hand, as well as a revision of sugar standards. In all of these international agreements, as well as others, the bureau is taking an active part for the benefit of American business.

There is a close tie-up between the Bureau of Standards and the National Screw Thread Commission, the director of the bureau being ex-officio charman of the commission. The recommendations of this commission, which have been made mandatory upon only a few Federal departments, have been widely accepted by industry. Practically all of the large manufacturing concerns in the United States are using the coarse and fine series of threads and the classification of screw thread fits set up by the National Screw Thread Commission.

In determining the extent to which American screw thread practice is actually in agreement with the standards set up by the National Screw Thread Commission, the Bureau of Standards is receiving the very active co-operation of the American Society of Mechanical Engineers, the Society of Automotive Engineers and a sectional committee organized under the American Standards Association, and a survey is just being completed of the screw thread practice of the country.

With another organization closely related to the automotive industry, namely, the American Petroleum Institute, representing both consumers and producers, the bureau is co-operating closely. Several of the A. P. I. standards for materials purchased by its members, for example, well casing, drill pipe and sucker-rod threads, are controlled by master gauges measured and certified by the bureau. These gauges serve as regional masters, by means of which other gauges and gauged products are so controlled as to insure interchangeability of products regardless of where or by whom the product may have been made.

This standardization work of the A. P. I. has now been extended, so that it has the status of an international industrial standard. In order to avoid the delay and expense incident to sending European gauges to the Bureau of Standards for test and certification, the institute has authorized the National Physical Laboratory of England and the Physikalisch Technische Reichsanstalt of Germany to test and certify gauges made to A. P. I. specifications in the same way that American gauges are tested and certified by the Bureau of Standards. Both of these national standardizing institutions keep in close touch with the bureau in regard to equipment and methods of test, and copies of all certificates and reports on A. P. I. gauges are forwarded to the bureau. This interchange of results is an important aid to international interchangeability.

One of the means whereby the Bureau of Standards contributes to the business welfare of the country is through the utilization of research associates to develop scientific and technical information which is of immediate use to the various industries. The bureau is authorized to accept the services of scientists and engineers who are employed and whose salaries are paid by scientific and technical groups and trade organizations and set them to work on appropriate researches which are agreed upon as of basic general importance to the industries in question.

The research associate plan was inaugurated to supplement the facilities of organizations conducting research and to afford facilities for those who have none. When requested to do so, it makes research possible for an organization by loaning equipment, providing quarters and affording facilities, data and supervision, giving training and experience in research under bureau auspices and co-operation to qualified workers. Many of the research associates working at the bureau have been engaged by, and are functioning for, consumers. Some of those employed by trade associations and technical societies are making researches of special interest to consumers. All of the research work of the associates is of definite benefit to the public. There are about 100 individuals stationed at the bureau under this plan, representing forty-four industries.

This audience will be particularly interested in hearing of some of the work we are doing in co-operation with your own industry. There are under way investigations of the basic principles underlying the design, performance, operation and testing of automotive engines, their fuels, lubricants, accessories and the power-transmitting systems used in connection with them for the promotion of economy, efficiency and safety in automotive transportation by land and air. I have already referred to the investigation of brakes and brake linings.

Among the recent investigations in the automotive field, mention may be made of automobile-engine acceleration; anti-knock characteristics of fuels; vapor lock in airplane and automobile fuel systems; gumming characteristics of gasoline; phenomena of combustion; gaseous explosions in engine cylinders; effect of humidity on engine performance; oxidation of carbon monoxide in the exhaust; measurement of road performance of automobile engines; cause of vibration of motor vehicles; automobile spring suspension systems; supercharging of aircraft engines, and

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INDIAN CO. REPORTS IMPROVED POSITION

Springfield, Mass., Nov. 2.—The Indian Motocycle Company reports a loss of $73,187.89 for the first nine months of 1931 after all charges, including provision for depreciation, interest, maintenance and repairs, etc., against a loss of $492,599.42 for the same period last year. The third quarter showed a loss of $44,763.08, after all charges, compared with profit of $30,205.93 for the quarter ended June 30 this year and loss of $123,806.40 for the third quarter of 1930. Depreciation reserve provided for the nine months ended September 30, this year, amounted to $86,956.29.

NEW ACCESSORY BRANCH

Jersey City, N. J., Nov. 2.—The Pep Boys—Manny, Moe and Jack—operators of a large chain of automobile accessory and radio supply stores throughout eastern Pennsylvania, New Jersey and Delaware, have opened a branch store in this city at Bergen Avenue and Vroom Street. It is the twenty-ninth store

BAY STATE BUILDS $22,900,000 IN ROADS

Boston, Mass., Nov. 2.—The Massachusetts Department of Public Works will bring to a close November 30 the most active year in its history. It has built more miles of highway and more bridges than in any other year. It has spent more money and furnished more employment than ever before.

During the year the department has let 494 contracts involving construction or reconstruction of 379½ miles of highway and the building of eighty-four bridges. Expenditures for this purpose, independent of state highway maintenance or miscellaneous expenses of the department, have totaled $22,900,000, including about $3,000,000 in Federal aid. Work has been provided for upward of 12,000 persons, including permanent employees of the department.

Last year the department built 257 miles of highway and only about half the number of bridges constructed this year. Its expenditures on highways were $14,851,645. The number of men employed last year is not definitely recorded but it is estimated by responsible authorities at not more than 5,000, including the permanent force.

LONG RADIATORS are standard equipment on THE FEDERAL SIX-WHEELER

LONG MANUFACTURING CO. DETROIT, MICHIGAN
AUTOMOTIVE CLUTCHES, RADIATORS, GRILLES

Automotive Daily News

"Of, By and For the Entire Automotive Industry"

Published Every Day Except Sunday and Monday by
AUTOMOTIVE DAILY NEWS PUBLISHING CORPORATION,
350 Hudson St., New York, N. Y.
O. J. Elder, President. H. A. Tarantous, Vice-President. Alexander Johnston, Secretary.
Entered as second-class matter August 27, 1926, at the post office at New York, N. Y., under the Act of March 3, 1879.
350 Hudson St., New York, N. Y. Telephone CA nal 6-1000

Member A. B. C.

Mail subscriptions to CIRCULATION DEPARTMENT 350 Hudson St.
Subscription Rates—One year, $12.00; two years, $20.00, for United States and Canada, also Mexico, Cuba and Panama.
To Other Countries—One Year, $15.00; two years, $26.00. Single copies, 5 cents.

TUESDAY, NOVEMBER 3, 1931

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Harry A. Tarantous Business Manager. 350 Hudson St., New York, N. Y.
George M. Slocum, Manager Detroit Bureau, 427 Fisher Building, Detroit, Mich., phone Trinity 2-3500; Willard R. Cotton, Western Manager, 333 North Michigan Ave., Chicago, Ill., phone Andover 2400; Metz B. Hayes, New England Manager, Little Building, Boston, Mass.; Blanchard, Nichols & Coleman, American National Bank Building, San Francisco, Cal.; Lincoln Building, Los Angeles, Cal.; 1037 Henry Building, Seattle, Wash. Address ALL advertising and business correspondence to 350 Hudson St., New York city.

EDITORIAL DEPARTMENT

350 Hudson St., New York, N. Y. Telephone CA nal 6-1000
Alexander Johnston, Editor. William C. Cellahan, News Editor.
Statistical Department (registrations and specifications), P. J. Robas, statistician; Engineering Department, A. Benson Carleton, technical editor; J. Russell Walsh, engineering editor. Merchandising Department, Charles S. Zach, editor. Art Department, John Bauerfeld director.
Detroit Bureau, Chris Sinsabaugh, editor, 427-8 Fisher Building, Detroit, Mich. Telephone Trinity 2-3500. Contributing editor, John C. Wetmore.

Farm Equipment Revives

ONE of the most encouraging signs in recent industrial activity is the modest but none the less convincing revival staged by manufacturers of farm machinery. Recent reports indicate that the International Harvester Company has resumed manufacture of farm equipment on a modest scale. Ten factories in the Moline-Davenport district, where farm implement manufacture centers, are reported going into production, though on a lower than normal basis. Among these companies are Deere & Co. and the Farmall division of the Harvester organization.

To understand the full significance of all this one must have some understanding of the farm implement business. The dealers who handle agricultural machinery are probably closer to their buying clientele than any other class of retail merchants in the world. They know their buyers by their first names; they know the size of the mortgages on their places and the balances they have at the bank; they know exactly what acreage is planted on every farm and how each crop is coming along and what it will bring in the market at any given date. They visit their prospective customers and even on occasion throw off their coats and help with the farm work.

If the dealers in farm equipment have indicated to their factories that there is a market for agricultural machinery, we may be certain that the sales will be made. There is nothing hit or miss about the methods of the implement dealers. They are positive before they talk sales.

On the other side of the picture. we have the farmers, who have been harder hit by the depression than almost any class of our citizens. With wheat selling at 50 cents a bushel or less, and with other staple crops at proportionate prices, the lot of the sturdy agriculturist has scarcely been a happy one. For two years the farmers have put off making equipment replacements, except in cases of actual emergency. They have refused to invest in machinery even though they have actually needed it. Truth to tell, they have not had money to make the investment, necessary though it might be.

But if the farmers are getting ready to buy equipment this year, there is only one answer. Replacement has now reached the emergency stage. They have put off buying new machinery until now they have no choice. They have got to have the equipment or give up their farms. How they are financing their purchases we do not know. Perhaps the rural banks have seen the light, realizing that to get back present investments in the farming industry they have got to finance future operations. At any rate we may be certain that the farmers somewhere have found cash or credit to invest in needed equipment.

The parallel to the motor vehicle situation is obvious. Car and truck owners last year and this have put off buying needed equipment. They have pieced and patched their old cars and trucks to make them go "until things pick up a bit." Obviously that sort of thing can go on just so far. We believe that the time has just about arrived when motor transport units have got to be replaced. Buying is not going back at one leap to the levels that held in 1928 and 1929, but it is going to pick up over the totals that 1931 will have to show.

Ford Prices Lower?

FORD'S reversion to the $6 a day wage schedule will save the Ford Motor Company approximately three million dollars a month when the full complement of men is employed.

Add to this the savings on parts through lower commodity prices.

It is reasonable to suppose that one of two things will happen. Either Ford will bring out his new line at lower list prices, or else his new line will be so much bigger and better equipped that he cannot afford to maintain the present list prices.

Ford's policy in the past has always been lower prices to attract the most buyers.

Trade Association News

Empire State Association Announces Changes

At the recent meeting of the Empire State Automobile Merchants' Association in Albany, N. Y., the by-laws were amended to increase the number of the board of directors from fifteen members to eighteen. The following directors were elected:

For a term of three years: J. F. Haas, Brooklyn; W. A. Carpenter, Albany; E. C. Bull, Buffalo; J. Van Benschoten, Poughkeepsie; J. B. Rusterholtz, Syracuse; E. D. Deane, Binghamton. For a term of two years: Frank C. Chapman, Plattsburg, N. Y. For a term of one year: George Stowe, New York city.

Those whose term of office did not expire this year are: Lee J. Eastman, New York city; H. W. Kellogg, Niagara Falls; Dr. R. N. Forbes, Olean; J. E. Hansen, Rochester; John Kovacs, Schenectady; F. H. Schwenke, Elmira; J. Ernest Miller, Glens Falls; W. W. Garabrant, Utica; Q. H. Ball, Troy; H. P. Hannan, Ogdensburg.

At the close of the meeting the directors met and organized by electing the following officers for the ensuing year: President, J. F. Haas; first vice-president, Q. H. Ball; second vice-president, E. C. Bull; secretary, H. W. Kellogg; treasurer, W. W. Garabrant.

It was voted that the next annual convention would be held in Niagara Falls, N. Y., early in October, 1932. The exact date will be set later.

Automobile Club of Phila. Issues Bulletin on New Tags

WALTER N. WHITE, manager of the license bureau of the Automobile Club of Philadelphia, has sent out a bulletin to members covering the forthcoming issuance of license tags. The bulletin is as follows:

"Powers-that-be at Harrisburg have advised us that the special number series coming under the reserved section has been exhausted, making it impossible from now on to get special numbers.

"Reservations for special numbers are usually open on June 1 of each year, and requests should be made at that time or during April or May.

"Distribution of numbers on the reserve list comes under the direction of Benjamin G. Eynon, commissioner of motor vehicles. In one division are all tags with numerals 1 to 999, all tags with single letters, all tags with double letters, all tags with single letters and numerals 1 to 99, and all tags with double letters and numerals 1 to 25.

"Under the second division are all tags with numerals 1,000 to 9,999, tags with double letters and numerals from 26 to 99, as well as tags with letters "A," "B" and "C," from 100 to 999.

"No other numbers are in the reserved section, and thus are impossible to obtain.

"Motorists who have received letters from the Department of Revenue advising them of the reserving of a special number should wait until they receive their renewal bill and then return the letter in the envelope inclosed for that purpose. Special numbers will not be assigned unless the renewal bill is accompanied by the letter.

"Motorists who have purchased new cars during the past year are cautioned to carefully examine the bills which they now have or will receive. They should ascertain if this bill is for the car now being operated. If the department has no record of the sale of your old car, you may receive two bills, one for the old car tags and one for the new car tags. Many motorists have encountered considerable difficulty and been put to much trouble because they mailed back to Harrisburg the renewal bill and check for tags for the old car, it then being necessary for them to have the tags transferred to the proper car. The department makes no charge for such transfer up to January 1, after which a $2 fee must be paid.

"Motorists who do not receive renewal bills for 1932 tags should check their address on present license cards, and, if incorrect, should send form M-18 to Harrisburg for such correction. No fee is required for such address change and forms are available free at the Club License Bureau and other license bureaus throughout the Philadelphia section."

C. F. LILLE APPOINTED

Minneapolis, Minn., Nov. 2.—C. F. Lille, well-known in automobile circles and formerly in the retail Ford business here, has been named general manager for the Sullivan Motor Company, Ford sales, at 800 West Broadway.

COMING EVENTS

NOVEMBER

5-14—**London, England.** International Commercial Motor Transport Exhibition. Olympia Hall.
10-12—**Chicago, Ill.** American Petroleum Institute, annual meeting. Hotel Stevens.
28-Dec. 9—**Brussels, Belgium.** Automobile Salon.
29-Dec. 5—**New York, N. Y.** Automobile Salon, Hotel Commodore.
30-Dec. 4—**New York City.** American Society of Mechanical Engineers, annual meeting.

DECEMBER

7-12—**Atlantic City, N. J.** Motor and Equipment Association and National Standard Parts Association, Joint Trade Show.
9-11—**Atlantic City, N. J.** American Institute of Chemical Engineers, meeting.

JANUARY

9-16—**New York City, National Automobile Chamber of Commerce, National Automobile Show.**
9-17—**Los Angeles.** Annual Automobile Show of the Los Angeles Motor Car Dealers Association.
10-13—**Chicago.** National Wheel and Rim Association, annual convention, Edgewater Beach Hotel.
11-14—**Detroit, Mich.** American Bean Builders Association, twenty-ninth convention and show.
14—**New York city.** Society of Automotive Engineers, annual dinner, Pennsylvania Hotel.
16-23—**Newark, N. J.** Newark Automobile Dealers' Association's annual show.
16-23—**Buffalo, N. Y.** Annual automobile show of Buffalo Automotive Trade Association, Inc., 174th Regiment Armory.
17-23—**Cincinnati.** Automobile show of Cincinnati Automobile Dealers' Association.
17-23—**Milwaukee.** Annual Automobile Show, Milwaukee Automotive Trades, Inc.
22-30—**New York.** National Motor Boat Show, Grand Central Palace.
23-30—**Baltimore.** Annual Automobile Show.
23-30—**Minneapolis.** Annual Automobile Show of Minneapolis Automobile Trade Association.
23-30—**Pittsburgh.** Annual automobile show of Pittsburgh Automobile Dealers' Association, Motor Square Garden.
25-29—**Detroit, Mich.** Society of Automotive Engineers, annual meeting, Book Cadillac Hotel.
30-Feb. 6—**Cleveland.** Annual Automobile Show of the Cleveland Automobile Manufacturers and Dealers Association, Public Auditorium.
30-Feb. 6—**Chicago, Ill. National Automobile Chamber of Commerce, National Automobile Show.**
30-Feb. 6—**Chicago, Ill. Automobile Salon, Hotel Drake.**

FEBRUARY

6-13—**St. Paul.** Annual Automobile Show St. Paul Automobile Dealers, Inc.
13-20—**Kansas City, Mo.** Annual Automobile Show, Kansas City Motor Car Dealers' Association, American Royal Building.
13-20—**Los Angeles, Cal.** Automobile Salon Hotel Biltmore.
22-March 5—**San Francisco, Cal.** Automobile Salon, Palace Hotel.

Production facilities, unsurpassed in this industry, provide that the careful engineering designed into each Kelsey-Hayes product will be carried out faithfully in every step of its fabrication

Relation of Motor Coach Chassis to the Body

The following paper was presented at the Thursday session of the National Transportation Meeting of the Society of Automotive Engineers at the Hotel Shoreham, Washington, D. C., last week. The complete paper which appeared in serial form in Automotive Daily News is concluded today.

By GEORGE H. SCRAGG
Mack International Motor Truck Corporation, New York City.

Frame rigidity is by all odds the easiest solution to the body builder's problem, although truly rigid chassis frames have proven anything but simple for the chassis designer. Because bus bodies should be low, the kicked-up frame in the rear early made its appearance and more recently the front drop has also been used. These introduced cranks in the side-rails, which greatly aggravated the tendency of the frame to weave. Space limitation as well as the desirability of a low floor, even under light load, have required limited spring deflection, which in turn increased the twisting moments on the frame.

Owing to the fact that the entire superstructure of the body is supported from the body sills at the outer edges of the floor and also to the fact that passenger weight is principally carried outside the frame, outriggers have long been used to support the floor through the outer sills instead of directly from the chassis frame. These outriggers, being cantilevers, have added more torsional stress to the side members and magnify the effects of frame weaving. This has led to the necessity of either trussing across the outriggers from side to side or attaching them rigidly to main cross-members, and it has also required increase in the stiffness of body sills, so that today these are usually of steel.

Bodies and frames share one unfortunate characteristic in common, namely, the point at which maximum weave occurs. In the body this is at the front door, since the door itself interrupts the sheer side while the large dash and windshield opening eliminate the bulkhead that would be desirable at this point. In the chassis, torsion similarly tends to localize at this point, due to the rigidity of the front part of the frame which is both required and imparted by the engine mounting, and the absence of cross-members from thence to the middle of the drive shaft. Body designers have met this situation by greatly increasing the rigidity of the cowl and the windshield arch. Chassis builders have co-operated by placing the greatest depth of side-members at this point by the use of extra stiff cross-members in the vicinity of the clutch and by enlarging engine hoods to take larger and stiffer body cowls.

Satisfactory as the progress has been along these lines, much of the success of the effort depends upon scientific determination of the best locations for anchor bolts, as has already been learned in the passenger car field, where the problem is much simpler. Complete rigidity of chassis or body structure is, of course, impossible. A satisfactory point is reached when rigidity is relative and within the capacity of flexible cushioning strips to allow for. But when this has been accomplished the location of the anchor bolts becomes a matter of extreme importance. Study of frame stresses will reval nodes or neutral axes about which flexure will take place. These are the ideal points, so far as the chassis is concerned, for the location of anchor bolts. The same thing applies to bodies. In both body and chassis structure, slight modifications of design permit these nodal points to be shifted to more favorable locations. Perfect co-ordination requires that they be so placed as to register, one with the other. Where too great a span intervenes between successive nodal points, yielding supports must be used if racking of the body or rumbling on the frame is to be avoided.

At one time the wheelbase was the principal chassis dimension. They seem to have been chosen in even feet or for their euphony. The result was often that the wheelhouse occurred at such a point that proper relation with the seats was impossible. Today, of course, the wheelbase is finally dependent upon the standard seat spacing for the type of body for which the chassis is designed.

Reverting to the matter of the frame kick-up, many early designs were laid out with insufficient consideration for the clearances actually required, so that the kick-up was often excessive both in length and height, and, consequently, seriously interfered with proper floor construction between the wheels. Today body considerations and boundary dimensions are the determining factors. The inside height of the kick-up is just sufficient to clear the axle when the differential housing is at the maximum height allowed by the ramp and the length of the kick-up is reduced to the minimum consistent with strength at the bends.

As a matter of fact, present trends are not only to hold the kick-up to the minimum size as dictated by required clearances, but there is a distinct tendency to largely absorb the kick-up as such in the new ramped frame form. Heretofore the frame was made approximately flat from the dash to the start of the kick-up, continuing on the same plane from the back of the kick-up to the rear end. Body floor construction, however, was developing along the present ramp lines, so that it was inclined at a slight angle from near the front door to the highest point over the rear axle and then carried flat to the rear. The effect was a decided discrepancy between the form of the frame and that of the body floor. Accordingly, the newer frames take the contour of the floor for their upper surfaces, save where a rudimentary kick-up clears the rear axle. This not only makes for greater frame rigidity by reducing the torsional moment at the kick-up, but it makes a simpler and more secure mounting for the body.

Basic bus design characteristics today are being conceived as a unit, with the requirements of the body as the principal design desiderata. To what extent this line of progress will modify conventional bus outlines and details of construction is indicated by the work already accomplished in chassis of the hoodless mass-transportation type. Even on the more conventional types greater compactness is being secured by straddle type dashes, semi-forward type controls and engines especially designed for longitudinal compactness. The time is fast approaching when the necessary but multitudinous and bulky engine accessories must be relocated or even driven by auxiliary engines, as on ships, if the power plant is not to be entirely smothered and made completely inaccessible by them. All of the newer bus engines show evidences of having had their basic design modified in order to bring the vital points requiring access out from behind the stockade of accessories. Forward controls may yet force the development of one-sided engines, as in England today. But whatever course development may take, the body must and will be the starting point.

G. W. TISDALE CO. MOVES TO LARGER QUARTERS

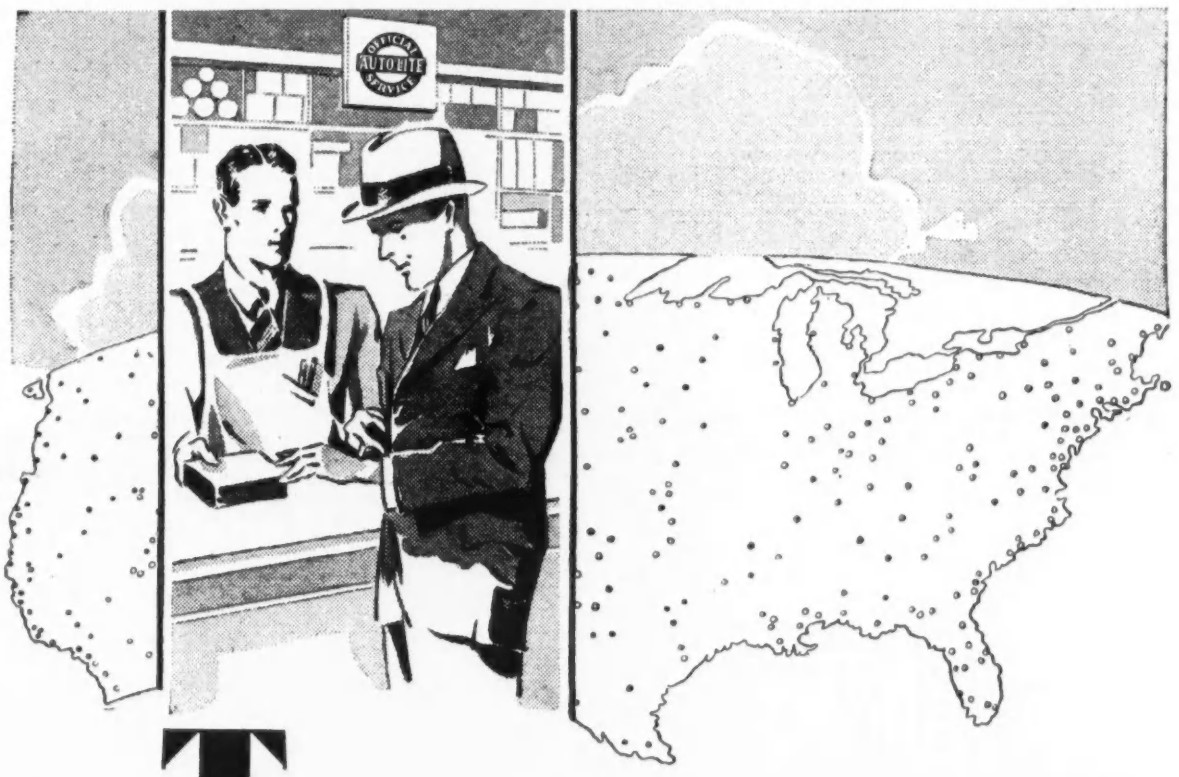
Newark, N. J., Nov. 2.—The Roehrle Motor Sales Company, it is announced by G. W. Tisdale, Inc., local Hupmobile distributor, has moved from 33 Washington Ave., Belleville, to a new and larger home several blocks farther down the avenue.

NATIONAL MOTORS NAMES 73 NEW DAY-ELDER DEALERS IN 2 MONTHS

Irvington, N. J., Nov. 2.—The National Motors Manufacturing Company of Irvington, builder of Day-Elder motor trucks, buses and fire apparatus, announces the appointment of seventy-three new dealers in New Jersey in September and October in a drive to obtain local service facilities for Day-Elder operators in every community of 1,000 population and over.

In furthering this policy, Day-Elder created a new relationship between local dealer and factory. The new Day-Elder dealer plan, according to F. T. Macrae, president of the National Motors Manufacturing Company, is said to be the first whereby the factory recognizes the local dealer's problems in a financial way rather than an advisory way.

"The operator of trucks being the first consideration to render him the best service, he must have local service and parts facilities at his immediate disposal," Mr. Macrae says, "because every hour a truck is tied up, the operator loses money.



THOUSANDS OF WIDE-AWAKE SERVICE STATIONS SUPPLYING GENUINE AUTO-LITE PARTS

In crowded metropolitan centers, in remote country crossroads, or on the well-travelled highways, there are Auto-Lite service stations. They are literally everywhere. Motorists are aware of the convenience and the high calibre of the service which the official sign of Auto-Lite signifies. It is one reason why most people prefer cars with Auto-Lite starting, lighting and ignition systems.

Strict adherence to a policy of building only the finest quality and workmanship into automotive electrical systems has won Auto-Lite the highest place in the industry. Equipping your product with Auto-Lite goes far toward winning public confidence. The Electric Auto-Lite Company, Toledo, Ohio.

Auto-Lite
Starting, Lighting & Ignition

MARYLAND AND W. VA. PLAN RECIPROCITY

Washington, Nov. 2.—The motor vehicle commissioners of Maryland and West Virginia have been holding a conference in this city relative to arranging reciprocity of touring privileges between the two states Information was exchanged as to the requirements of the states involved as regards passenger cars, trucks and buses. H. H. Kelly, assistant to the chief of the division of highway transport, bureau of public roads, made the following oral statement regarding the conference:

The conference was one of a series being held by West Virginia officials with officials of the five states on which it borders. Conferences have been held with Virginia, Pennsylvania and Ohio, and one will be held with Kentucky.

Two movements toward interstate reciprocity are under way. One is the series of conferences being held by West Virginia and the other is a result of a conference of officials of eight states last December in Detroit, at which Illinois, Indiana, Iowa, Ohio, Pennsylvania, West Virginia, Wisconsin and Michigan were represented. These states plan another conference November 9 to discuss legislation providing for reciprocity.

M. D. Schroeder, deputy commissioner of vehicles of Maryland; Harold Tomkins, member of the West Virginia roads commission, and F. O. Sanders, supervisor of motor vehicles of West Virginia, took part in the conference October 26. The discussions centered around differences in requirements of the two states as respects trucks classed as contract carriers and as common carriers.

THOMPSON PRODUCTS PLANS AGGRESSIVE SALES CAMPAIGN

Cleveland, O., Nov. 2.—As an advance movement to an aggressive sales campaign in 1932 Thompson Products, Inc., announces several changes of an expansive nature, including the relocation of three branches, the opening of a new branch and a general strengthening of the sales organization.

Burke Patterson, Thompson replacement sales manager, states increased car registration and gasoline consumption, coupled with a decline in new car production, point conclusively to a large replacement parts business during the next year, and well-calculated efforts are being made by the company to take advantage of it.

Company branches in New York city, Atlanta and Kansas City have been moved to more accessible locations, while an additional branch has been opened in Los Angeles.

Two men, T. O. Duggan and E. T. Syvertsen, have been appointed to afford closer factory-jobber contact, and offer additional supervision to sales work. Duggan, who was formerly merchandising director of the N. S. P. A., will work in the Cleveland, New York and Atlanta territories, and Syvertsen, formerly a district manager, will cover the Chicago, Minneapolis, Kansas City and Pacific Coast sections.

S. P. Bayless and Phil Sommerlad are appointed district managers, respectively, of the Chicago and Minneapolis territories. L. J. Lutz, formerly of the Link Belt Manufacturing Company, has been made junior salesman in the Chicago territory, and I. J. Carlblom, formerly with Reinhard Brothers, will work out of Minneapolis.

Charles Cole, who was with the Kellog Manufacturing Company, will serve as junior salesman in the Atlanta district, and E. M. O'Neill is to have the same capacity in the Cleveland territory.

BUS LINE IS SOLD

Trenton, N. J., Nov. 2.—The Belleville-Lyndhurst Bus Company was given permission by the Public Utility Commission today to take over a local line in Rutherford recently purchased from the Great Eastern Transportation Company.

MAJOR SPECIFICATIONS AND MECHANICAL DETAILS

Make and Model	Weight—5-P. Sedan	Wheel Base	Engine Make	Thermostat Used	Valve Arrangement	Cylinders	Bore and Stroke	Piston Disp.	Compression Ratio	Tax H. P.	Brake, H.P. and Peak R. P. M.	Pist. Make or Material	No. Main Br.	Oil Purifier	Fuel Cleaner	Carburetor	Air Cleaner
Auburn 8-98	3916	127-136	Lyc	Dole	L	8	3 x4¾	268	*5.26	28.8	98@3400	*Alum	5	Pur	—	Sch	No
Austin	§1130	75	Own	——	L	4	2.2x3	45.6	5.1	7.8	13@3000	Alum	2	—	—	Til	No
Buick 8-50	3170	114	Own	Bish-Bab	O	8	2⅞x4¼	220.7	4.75	26.45	77@3200	CI	5	AC	AC	Mar	AC
Buick 8-60	3795	118	Own	Bish-Bab	O	8	3 1/16x4⅝	272.6	4.63	30.02	90@3000	CI	5	AC	AC	Mar	AC
Buick 8-80	4255	124	Own	Bish-Bab	O	8	3 5/16x5	344.8	4.5	35.12	104@2800	CI	5	AC	AC	Mar	AC
Buick 8-90	4340	132	Own	Bish-Bab	O	8	3 5/16x5	344.8	4.5	35.12	104@2800	CI	5	AC	AC	Mar	AC
Cadillac V-8	4645	134	Own	Yes	LV	8	3⅜x4 1/16	353	5.35	36.45	95@3000	CI	3	AC	Gas	Own	No
Cadillac V-12	5480	140-143	Own	Own	O	12	3½x4	368	5.5	46.9	135@3400	CI	4	AC	Gas	Own	No
Cadillac V-16	6100	148	Own	Yes	O	16	3 x4	452.0	5.50	57.5	165@3400	CI	5	AC	Gas	Own	No
Chevrolet	2685	109	Own	No	O	6	3 1/16x3¾	194.0	5.00	26.3	50@2600	CI	3	—	AC	Car	AC
Chrysler 6	2850	*175⅞	Own	Yes	L	6	3¼x4⅜	217.8	5.35	25.35	80@3400	*Alum	4	—	AC	Sch	Yes
Chrysler 8 De L.	——	187 5/16	Own	Yes	L	8	3¼x4¼	282.1	5.20	33.80	100@3400	*Alum	5	Yes	Yes	Str	Yes
Chrysler Imp. 8	4725	*211	Own	Yes	L	8	3½x5	384.8	5.00	39.2	125@3200	*Alum	9	Yes	AC	Str	Yes
Cord (Fr. Wh. D.)	4620	137½	Lyc	——	L	8	3¼x4½	298.6	5.25	33.8	115@3300	*Alum	5	Pur	AC	Sch	No
De Soto Six	2695	*169 7/16	Own	Yes	H	6	3¼x4⅛	205.3	5.35	25.35	72@3400	*Alum	4	—	AC	Car	Yes
De Soto Eight	3025	*176⅞	Own	Yes	L	8	2⅞x4¼	220.7	5.40	26.45	77@3400	*Alum	5	—	AC	Str	Yes
De Vaux 6-75	2810	113	Hall	Dole	L	6	3⅜x4	214.7	5.41	27.34	70@3400	Alum	4	AC	Ste	Til	AC
Dodge Six	2820	*176 3/32	Own	Yes	L	6	3¼x4¼	211.5	5.31	25.35	74@3400	*Alum	4	No	AC	Car	AC
Dodge Eight	3174	*180 3/32	Own	Yes	L	8	3 x4¼	240.3	5.40	28.80	84@3400	*Alum	5	Pur	AC	Str	AC
Durant 612	2820	112	Con	Bish-Bab	L	6	3¼x4	199	5.32	25.4	71@3300	*Alum	4	AC	AC	Str	AC
Durant 614	3010	112	Con	Bish-Bab	L	6	3¼x4	199	5.32	25.4	71@3300	*Alum	4	AC	AC	Str	AC
Durant 619	2710	109	Con	Bish-Bab	L	6	3¼x4	199	5.32	25.4	71@3300	*Alum	4	AC	AC	Til	AC
Essex Super Six	2750	**113	Own	——	†L	6	2⅞x4½	175.3	5.80	19.8	60@3300	Alum	3	—	Ste	Mar	AC
Ford A	2375	103½	Own	——	L	4	3⅞x4¼	200.5	4.22	24.03	40@2200	Alum	3	—	—	Zen	—
Fr'klin S 15 Trans.	3930	125	Own	Bish-Bab	*O	6	3½x4¾	274	5.30	29.4	100@3100	*Alum	7	AC	AC	Str	AC
Fr'klin S 15 Trans.	4130	132	Own	Bish-Bab	*O	6	3½x4¾	274	5.30	29.4	100@3100	*Alum	7	AC	AC	Str	AC
Fr'klin S 15 De L	4220	132	Own	Bish-Bab	*O	6	3½x4¾	274	5.30	29.4	100@3100	*Alum	7	AC	AC	Str	AC
Graham Pros. 6	3100	113	Own	Yes	L	6	3⅛x4½	207	5.45	23.4	70@3200	*Alum	7	—	AC	Sch	Yes
Graham Std. 6	3265	115	Own	Yes	L	6	3¼x4½	224	5.45	25.35	76@3400	*Alum	7	—	AC	DL	Yes
Graham Spl. 6	3330	115	Own	Yes	L	6	3¼x4½	224	5.45	25.35	76@3400	*Alum	7	—	AC	DL	Yes
Graham Spl. 8	3560	120	Own	Yes	L	8	3⅛x4	245	5.45	31.25	85@3400	*Alum	5	AC	AC	DL	Yes
Graham Cust. 8	4100	134	Own	Yes	L	8	3¼x4½	298	5.20	33.80	100@3400	*Alum	5	AC	AC	DL	Yes
Hudson Greater 8	3115	119-126	Own	——	L	8	2⅞x4½	233.7	5.80	26.4	87@3600	Alum	5	—	Ste	Mar	AC
Hupmobile Cen. 6	2985	114	Own	——	L	6	3¼x4¼	211.6	5.10	25.35	70@3200	Alum	4	AC	Ste	Str	Yes
Hupmobile Cen. 8	3275	118	Own	Pines	L	8	2⅞x4⅝	240.2	5.20	26.45	90@3200	Alum	5	Pur	Ste	Str	Yes
Hupmobile C	3730	121	Own	Pines	L	8	3 x4¾	268.6	5.20	28.8	100@3200	CI	5	Pur	Ste	Str	Yes
Hupmobile H & U	**	125-137	Own	Pines	L	8	3½x4¾	365.6	5.20	39.2	133@3400	Alum	5	Pur	Ste	Str	AM
La Salle V-8	4635	134	Own	Yes	LV	8	3⅜x4 1/16	353	5.35	36.45	95@3000	CI	3	AC	Gas	Own	—
Lincoln	5300	145	Own	Ful	L	8	3½x5	384	5.23	39.2	120@2900	Alum	5	Pur	Ste	Str	Un
Marmon 70	2823	112¾	Own	Pines	L	8	2 1/16x4¼	211.2	5.50	25.4	84@3400	Alum	5	AC	AC	Str	AC
Marmon 88	‹ 75	130-136	Own	Pines	L	8	3¼x4¾	315.2	5.50	33.8	125@3400	Alum	5	AC	AC	Str	AC
Marmon 16	5360	145	Own	Pines	O	16	3⅛x4	490.8	6.00	62.5	200@3400	Alum	5	Flo	AC	Str	AC
Nash 960	2800	114¼	Own	Bish-Bab	L	6	3⅛x4⅜	201.3	5.00	23.4	65@3200	*Alum	7	AC	AC	Car	AC
Nash 970	3000	116¼	Own	Bish-Bab	L	8	2⅞x4⅜	227.2	5.00	26.4	78@3300	*Alum	9	AC	AC	Str	AC
Nash 980	3360	121	Own	Bish-Bab	O	8	3 x4¼	240	5.25	28.8	94@3400	*Alum	9	AC	AC	Str	AC
Nash 990	4000	124-133	Own	Bish-Bab	O	8	3¼x4½	298.6	5.25	33.8	115@3600	*Alum	9	AC	AC	Str	AC
Oakland V-8	3260	117	Own	Yes	H	8	3 1/16x3⅜	251.0	5.00	37.8	85@3400	S St	3	—	AC	Mar	AC
Oldsmobile	2935	113½	Own	——	L	6	3 1/16x4⅛	197.5	5.06	24.4	65@3350	CI	4	AC	AC	Str	AC
Packard 901-902	4570	129½-136½	Own	Yes	L	8	3 1/16x5	320.0	6.00	32.5	110@3200	*Alum	9	Yes	Yes	Own	AC
Packard 903-904	5045	142⅛-147⅛	Own	Yes	L	8	3½x5	384.8	6.00	39.2	135@3200	*Alum	9	Yes	Yes	Own	AC
Peerless St. 8	3642	118	Con	Bish-Bab	L	8	2⅞x4¾	246.0	5.00	26.45	90@3200	*Alum	5	Pur	AC	Sch	AC
Peerless Master 8	4521	125	Con	Bish-Bab	L	8	3⅜x4½	322	5.00	36.45	115@3200	*Alum	5	Pur	AC	Sch	AC
Peerless De L.	4521	125	Con	Bish-Bab	L	8	3⅜x4½	322	5.00	36.45	115@3200	*Alum	5	Pur	AC	Sch	AC
Peerless Custom 8	4766	138	Con	Bish-Bab	L	8	3⅜x4½	322	5.00	36.45	120@3200	*Alum	5	Pur	AC	Sch	AC
Pierce-Arrow 43	4304	134-137	Own	Yes	L	8	3½x4¾	366	5.07	39.2	125@3000	*Alum	9	Han	AC	Str	Un
Pierce-Arrow 41-42	4831	142-147	Own	Yes	L	8	3½x5	385	5.07	39.2	132@3000	*Alum	9	Han	AC	Str	Han
Plymouth	2710	109	Own	——	L	4	3⅝x4¾	196.1	4.90	21.03	56@2800	*Alum	3	—	AC	Car	Yes
Pontiac	2845	112	Own	Yes	L	6	3 1/16x3⅞	200.0	4.90	26.3	60@3000	S St	3	—	AC	Mar	AC
Reo Royale 8-35	4650	135	Own	Pines	L	8	3⅜x5	358	5.30	36.48	125@3300	Alum	9	Han	AC	Sch	Own
Reo Royale 8-31	4375	131	Own	Pines	L	8	3⅜x5	358	5.30	36.48	125@3300	Alum	9	Han	AC	Sch	Own
Reo 8-21	3610	121	Own	Yes	L	8	3 x4¾	268.6	5.37	28.8	90@3300	*Alum	5	Han	—	Sch	Un
Reo 6-21	3525	121	Own	Yes	L	6	3⅜x5	268.3	5.30	27.3	85@3200	Alum	7	Han	—	Sch	Un
Reo Fly. Cloud 6-25	3950	125	Own	Yes	L	6	3⅜x5	268.3	5.30	27.34	85@3200	Alum	7	Han	V S	Sch	Un
Reo 8-25	4050	125	Own	Yes	L	8	3 x4¾	268.6	5.37	28.8	90@3300	*Alum	5	Han	V S	Sch	Un
Studebaker Six	2920	114	Own	Dole	L	6	3¼x4⅛	205.3	5.20	25.4	70@3200	CI	4	Flo	Ste	Str	No
Studebaker Dict. 8	3095	114	Own	Dole	L	8	3 1/16x3¾	221.0	5.00	30.0	81@3200	Alum	9	Pur	Ste	Str	AM
Studebaker Com. 8	3520	124	Own	Dole	L	8	3 1/16x4¼	250.4	5.20	30.0	101@3200	Alum	9	Pur	Ste	Str	Un
Studebak'r Pres 80	4250	130	Own	Dole	L	8	3½x4⅜	337	5.10	39.2	122@3200	*Alum	9	Han	Ste	Str	AM
Studebak'r Pres. 90	*4360	136	Own	Dole	L	8	3½x4⅜	337	5.10	39.2	122@3200	*Alum	9	Han	—	Str	AM
Stutz LA	4320	127½	Own	——	O	6	3⅜x4½	241.5	5.10	27.3	85@3150	*Alum	7	Wal	AC	Zen	Un
Stutz MA	4918	134½	Own	——	O	8	3⅜x4½	322	5.50	36.4	113@3300	*Alum	9	Wal	AC	Zen	AM
Stutz MB	4863	145	Own	——	O	8	3⅜x4½	322	5.50	36.4	113@3300	*Alum	9	Wal	AC	Zen	AM
Stutz DV 32	5240	134½	Own	Bish-Bab	O	8	3⅜x4½	322	5.10	36.4	161@3900	Alum	9	Wal	Ste	Sch	AM
Willys 6-97-98 D	*	110-113	Own	Var	L	6	3¼x3⅞	193	5.26	25.3	65@3400	CI	4	Flo	AC	Til	Til
Willys 8-80 D	3131	121	Own	Var	L	8	3⅛x4	245.4	5.26	31.25	80@3200	CI	5	Flo	AC	Til	Til
Willys-Knt. 66-D	3400	121	Own	Var	K	6	3⅜x4¾	255	5.26	27.3	87@3200	*Alum	7	Flo	Til	Til	Til
Willys-Knight 95	3122	113	Own	Pines	K	6	2 1/16x4⅜	177.9	5.55	20.7	60@3400	*Alum	7	*	AC	Til	AC

What the Standards Bureau Is Doing for Business

(Continued from Page 3)

type testing of airplane engines.

One of the research projects which has been in progress at the Bureau of Standards for several years should be of particular interest to this group. About 1920 the automotive industry, producing motor vehicles, and the petroleum industry, supplying the fuels for them, were almost at sword's point. The quality of gasoline necessarily had been changing for the worse, and the car designers had been forced to use more and more drastic measures to get this fuel to burn. Each industry blamed the other for all the trouble, and any conference between them was in danger of ending in a fight. Finally, a small group of men from the two industries formed a plan for joint action to determine the facts about the matter through a group of research associates at the Bureau of Standards. Supported jointly on a 50-50 basis by the two industries to the total extent of some $10,000 per annum, this group of research associates has been working since 1922 on a variety of problems concerning gasoline for the common benefit of the two industries, and incidentally for transportation interests, since most of the results obtained have been reflected in better conditions for the operator. The first problem started by these research associates related to the sort of gasoline that is most economical. The answer was soon found, and it was contrary to what most engineers expected. The answer was that, at that time, the most economical gasoline was the least volatile, or "poorest" gasoline, which would burn without difficulty. Although this conclusion may not hold today, it resulted for several years in better gasoline economy for the operator, saving perhaps $100,000,000 a year to gasoline users.

The answer to this question, however, raises still others. It was found that heavy gasoline left residue in the crankcase, thereby causing dilution of the oil and making necessary frequent changes and waste of lubricating oil. The causes of this behavior were analyzed and the knowledge of the exact causes and conditions shortly led to remedies by changes in design. Most vehicles today are reasonably free from this trouble.

Engine starting difficulties in cold weather had always been a nuisance, not to say a source of sales resistance in the winter. A very thorough study was made of the requirement for easy starting and it was shown exactly what qualities in the fuel are necessary for easy starting at any temperature. The results are doubtless apparent to all who have had to do with motor vehicles. Winter starting now seldom gives any trouble. The two industries, given the necessary scientific data, have solved the problem.

In the past two or three years, changes in vehicle design and in the gasoline supply have led to a new difficulty in failing of gasoline in the supply line which causes stopping of the engine commonly known as "vapor lock." Fortunately, this condition was predicted in advance by the engineers employed on this co-operative research program, and they have analyzed the causes and suggested remedies which will solve the problem as soon as new designs are brought out. In accomplishing this nearly every model of passenger car and some trucks and airplanes have been studied in detail and the respective makers have been given the data with pertinent suggestions for improvements.

(To Be Continued)

OF PRESENT AMERICAN PASSENGER CAR MODELS

Make and Model	Front End Drive	Ignition System	Gen. and Starter	Clutch	Transmission Make	Transmission Speeds	Transmission Type	Universals	Rear Axle	Ratio	Brakes	Steering Gear	Spring Rear	Springs Shackles	Chassis Lubric.	Tires
Auburn 8-98	Chain	Del-R	*Del-R	Long	D	3	LGS-F-SM	U	Col ½	*4.45	S D	Ross	S 56¾	Own	Bijur	17x5.50
Austin	Gear	Aut-L	*Aut-L	Rock	WG	3	——	S	Sal ½	5.25	M	Say-B	Cant	Own	Al-Z	18x3.75
Buick 8-50	Tex	Del-R	Del-R	Own	M	3	SM	O	Own ½	4.54	Bendix	Sag	S 54½	Tryon	Al-Z	18x5.25
Buick 8-60	Tex	Del-R	Del-R	Own	O	3	SM	O	Own ¾	4.45	M	Sag	S 55¼	Own	Alem	19x5.50
Buick 8-80	Tex	Del-R	Del-R	Own	O	3	SM	O	Own ¾	4.27	M	Sag	S 58⅞	Own	Al-Z	19x6.50
Buick 8-90	Tex	Del-R	Del-R	Own	O	3	SM	O	Own ¾	4.27	M	Sag	S 58⅞	Own	Al-Z	19x6.50
Cadillac V-8	Morse	Del-R	Del-R	Own	O	3	SM	S	Own ¾	4.75	Own-M	Sag	S 58	Own	Al-Z	19x6.50
Cadillac V-12	Morse	Del-R	Del-R	Own	O	3	SM	S	Own ¾	——	Own-M	Sag	S 58	Own	Alem	19x7.00
Cadillac V-16	Morse	Del-R	Del-R	Own	O	3	SM	S	Own ¾	4.39	Own	Sag	S 60	Own	Alem	19x7.00
Chevrolet	Var	Del-R	*Del-R	Own	O	3	——	O	Own	4.10	M	Sag	S 54	——	Alem	19x4.75
Chrysler 6	Morse	Del-R	Del-R	Borg	O	3	BW-F	U	Own ½	4.60	H	War	S 53⅞	Tryon	Al-Z	19x5.25
Chrysler 8 De L.	Morse	Del-R	Del-R	Borg	O	4	BW-F	—	Own ½	4.30	H	——	S 54⅝	——	Al-Z	17x6.50
Chrysler Imperial 8	Morse	Del-R	Del-R	Borg	O	4	BW-F	—	Own ½	3.82	H	Ross	S 57½	——	Al-Z	18x7.00
Cord (Fr. Wh. Dr.)	Link	Del-R	*Del-R	Long	D	3	——	*	Col F	4.80	H	Gem	S 62	Own	Bijur	18x7.00
De Soto Six	Var	Del-R	Del-R	Borg	O	3	BW-F	—	Own ½	4.33	H	Own	S 53⅜	——	Al-Z	19x5.00
De Soto Eight	Var	Del-R	Del-R	Borg	O	3	BW-F	—	Own ½	4.60	H	Own	S 54⅝	Rub B	Al-Z	19x5.25
De Vaux 6-75	Morse	Aut-L	*Aut-L	Borg	N	3	NP-F	S	NP ½	4.40	S D	NP	S 54¼	Tryon	Al-Z	19x5.00
Dodge Six	Morse	Del-R	Del-R	Borg	O	3	BW-F	S	Own ½	4.60	H	War	S 55¼	Tryon	Al-Z	19x5.00
Dodge Eight	Morse	Del-R	Del-R	Borg	O	3	BW-F	S	Own ½	4.60	H	War	S 54⅝	Rub B	Al-Z	18x5.50
Durant 612	Morse	Aut-L	*Aut-L	Borg	W	3	——	S	Own ½	4.40	S D	Own	S 55	Tryon	Al-Z	19x5.00
Durant 614	Morse	Aut-L	*Aut-L	Borg	W	3	——	S	Own ½	4.40	S D	Own	S 55	Tryon	Al-Z	19x5.00
Durant 619	Morse	Aut-L	*Aut-L	Borg	W	3	——	S	Own ½	3.90	S D	Own	S 54	Tryon	Al-Z	19x4.75
Essex Super Six	Morse	Aut-L	*Aut-L	Own	O	3	BW-F	S	Own ½	5.40	Bendix	Gem	S 54⅛	Own	Alem	19x5.00
Ford A	Var	Own	*Own	Own	O	3	——	S	Own ¾	3.78	M	Gem	S Tr39	Own	Al-Z	19x4.75
Franklin S 15 Trans.	Chain	Del-R	*Del-R	Br-L	*	—	——	M	Own ½	‡4.54	H	Gem	El 42	None	Al-Z	19x6.50
Franklin S 15 Trans.	Chain	Del-R	*Del-R	Br-L	*	—	——	M	Own ½	‡4.54	H	Gem	El 42	None	Al-Z	19x6.50
Franklin S 15 De L	Chain	Del-R	*Del-R	Br-L	WG	3	——	S	Own ½	‡4.73	H	Gem	El 42	None	Al-Z	19x6.50
Graham Bros. 6	Link	Del-R	*Del-R	Long	—	3	BW-F	—	——	4.45	H	Ross	S 54	ERS	Al-Z	19x5.00
Graham Std. 6	Link	Del-R	*Del-R	Long	—	3	BW-F	—	——	4.30	H	Ross	S 54	ERS	Al-Z	5.50x18
Graham Spl. 6	Link	Del-R	*Del-R	Long	—	4	BW-F	—	——	4.09	H	Ross	S 54	ERS	Al-Z	6.00x17
Graham Spl. 8	Link	Del-R	*Del-R	Long	—	4	BW-F	—	——	4.09	H	Ross	S 54	ERS	Al-Z	6.00x17
Graham Cust. 8	Link	Del-R	*Del-R	Long	—	4	BW-F	—	——	4.09	H	Ross	S 56	ERS	Al-Z	6.50x18
Hudson Greater 8	Morse	Aut-L	*Aut-L	Own	O	3	BW-F	S	Own ½	4.64	Bendix	Gem	S 54⅛	Own	Alem	18x5.50
Hupmobile Cen 6	Chain	Aut-L	*Aut-L	Borg	WG	3	BW-F	M	Sal ½	4.70	S D	Ross	S 53	Tryon	Al-Z	19x5.50
Hupmobile Cen 8	Morse	Aut-L	*Aut-L	Borg	WG	3	BW-F	U	Sal	4.55	S D	Ross	S 52¾	Rub B	Al-Z	19x5.50
Hupmobile C	Morse	Aut-L	*Aut-L	Long	WG	3	BW-F	U	Own ½	4.55	S D	Ross	S 54	Own	Alem	19x6.00
Hupmobile H and U	Morse	Aut-L	*Aut-L	Long	WG	3	BW-F	U	Own ½	4.07	S D	Ross	S 57	Own	Alem	19x6.50
La Salle V-8	Morse	Del-R	Del-R	Own	O	3	SM	S	Own ¾	4.75	Own-M	Sag	S 58	Own	Alem	19x6.50
Lincoln	——	Aut-L	*Aut-L	Long	O	3	BW-F	S	Tim F	4.58	Bendix	Own	S 62	Own	Alem	7.00x19
Marmon 70	Diam	Del-R	*Del-R	Rock	WG	3	BW-F	S	Sal ½	4.70	Bendix	Ross	S 54⅛	Tryon	Al-Z	29x5.50
Marmon 88	Diam	Del-R	*Del-R	Rus	D	3	BW-F	S	Sal ½	4.45	Bendix	Ross	S 60	Rub B	Al-Z	19x6.50
Marmon 16	Diam	Del-R	Del-R	Rus	M	3	BW-F	S	Sal ½	3.78	Bendix	Ross	S 60	Rub B	Al-Z	18x7.00
Nash 960	Cel	Aut-L	*Aut-L	Borg	O	3	SM-DG-F	—	Own ½	4.72	M	Ross	S 50⅞	——	Alem	19x5.00
Nash 970	Diam	Aut-L	*Aut-L	Borg	O	3	SM-DG-F	—	Own ½	4.73	M	Ross	S 50⅞	——	Alem	19x5.25
Nash 980	Diam	*Aut-L	*Aut-L	Borg	O	3	SM-DG-F	—	Own ½	4.46	M	Gem	S 55	——	Bijur	18x6.00
Nash 990	Diam	*Aut-L	*Aut-L	Borg	O	3	SM-DG-F	—	Own ½	4.50	M	Gem	S 57½	——	Bijur	19x6.50
Oakland V-8	Morse	Del-R	Del-R	Own	M	3	SM	M	Own ½	3.90	M	Sag	S 54½	Inlox	Al-Z	28x5.50
Oldsmobile	Chain	Del-R	Del-R	Borg	M	3	SM	U	Own ½	4.54	Bendix	Sag	S 54½	Tryon	Alem	28x5.25
Packard 901-902	Morse	N E	Dyn	Long	O	4	SM	M	Own ½	4.66	M	Own	S 60½	Own	Bijur	6.50x19
Packard 903-904	Morse	N E	Dyn	Long	O	4	SM	M	Own ½	4.66	M	Own	S 60½	Own	Bijur	7.00x19
Peerless St. 8	Morse	Aut-L	*Aut-L	Rock	WG	3		S	Sal ½	4.70	Bendix	Ross	S 56⅞	Rub B	Alem	29x5.50
Peerless Master 8	Morse	Aut-L	*Aut-L	Rock	WG	3	BW-F	S	Sal ½	4.45	Bendix	Ross	S 60	Rub B	Alem	31x6.00
Peerless De L.	Morse	Aut-L	*Aut-L	Rock	WG	3	BW-F	S	Sal ½	4.45	Bendix	Ross	S 60	Rub B	Alem	31x6.00
Peerless Custom 8	Morse	Aut-L	*Aut-L	Rock	WG	3	BW-F	S	Sal ½	4.45	Bendix	Ross	S 60	Rub B	Alem	31x6.50
Pierce-Arrow 43	Gear	Del-R	Del-R	Long	O	3	BW-F	S	Own ½	4.08	Bendix	Ross	S 60	Faf	Al-Z	19x6.50
Pierce-Arrow 41-42	Chain	Del-R	Del-R	Long	O	3	BW-F	S	Own ½	*	Bendix	Ross	S 61	Faf	Al-Z	18x7.00
Plymouth	Var	Del-R	Del-R	Own	O	3	BW-F	O	Own ½	4.33	H	War	S 53⅜	Tryon	Al-Z	19x4.75
Pontiac	Morse	Del-R	Del-R	Own	O	3	——	M	Own ½	4.55	M	Sag	S 54	Inlox	Al-Z	29x5.00
Reo Royale 8-35	Morse	Del-R	Del-R	Long	O	3	SM	U	Own ½	4.07	H	Ross	S 57½	Own	Far	6.50x18
Reo Royale 8-31	Morse	Del-R	Del-R	Long	O	3	SM	U	Own ½	4.07	H	Ross	S 57½	Own	Al-Z	6.50x18
Reo 8-21	Link	Del-R	Del-R	Long	O	3	SM	U	Own ½	4.42	H	Ross	S 55¾	Tryon	Al-Z	17x6.00
Reo 6-21	Morse	Del-R	Del-R	Long	O	3	SM	U	Own ½	4.07	H	Ross	S 55¾	Tryon	Al-Z	17x6.00
Reo Fly. Cloud 6-25	Morse	Del-R	*Del-R	Long	O	3	SM	U	Own ½	4.42	H	Ross	S 55¾	Own	Al-Z	17x6.50
Reo 8-25	Link	Del-R	*Del-R	Long	O	3	SM	U	Own ½	4.42	H	Ross	S 55¾	Own	Al-Z	17x6.50
Studebaker Six	Chain	Del-R	*Del-R	Long	O	3	BW-F	S	Own ½	4.73	Bendix	Ross	S 54	Tryon	Alem	19x5.25
Studebaker Dict. 8	Var G	Del-R	*Del-R	Long	O	3	BW-F	S	Own ½	4.73	Bendix	Ross	S 54	Tryon	Alem	19x5.25
Studebaker Com. 8	Var G	Del-R	*Del-R	Long	O	3	BW-F	S	Own ½	4.73	Bendix	Ross	S 56	Faf	Al-Z	19x6.00
Studebaker Pres. 80	Var G	Del-R	Del-R	Long	O	3	BW-F	S	Own ½	4.31	Bendix	Ross	S 60	Faf	Al-Z	19x6.50
Studebaker Pres. 90	Var G	Del-R	Del-R	Long	O	3	BW-F	S	Own ½	4.31	Bendix	Ross	S 60	Faf	Al-Z	19x6.50
Stutz LA	——	Del-R	Del-R	Borg	D	4	——	U	Sal ½	4.75	H	Gem	S 60	Own	Bijur	19x6.00
Stutz MA	——	Del-R	Del-R	Long	D	4	——	M	Tim ½	4.75	H	Gem	S 62¼	Own	Bijur	20x6.50
Stutz MB	——	Del-R	Del-R	Long	D	4	——	M	Tim ½	4.75	H	Gem	S 62¼	Own	Bijur	20x7.00
Stutz DV 32	——	Del-R	Del-R	Long	D	4	——	M	Tim ½	4.75	H	Gem	S 62¼	Own	Bijur	18x7.00
Willys 6-97-98 D	Chain	Aut-L	*Aut-L	Borg	O	3	BW-F	S	Own ½	4.60	Bendix	Own	*S 49¾	Tryon	Alem	19x5.00
Willys 8-80 D	Chain	Aut-L	*Aut-L	Borg	O	3	BW-F	S	Own ½	4.40	Bendix	Ross	S 56	Tryon	Alem	18x5.50
Willys-Knight 66 D	Chain	Aut-L	*Aut-L	Rock	O	3	BW-F	S	Own ½	4.18	Bendix	Ross	S 56	Tryon	Alem	18x6.00
Willys-Knight 95	Chain	Aut-L	Aut-L	Borg	O	3	BW-F	S	Own ½	4.89	Bendix	Gem	S 51	Tryon	Alem	19x5.00

KEY TO ABBREVIATIONS

Weight—‡Austin standard 2 passenger coupe. **Hupmobile model H weighs 4,095 pounds, and model U 4,360 pounds. *Studebaker, 7 pass sedan. *Willys 6-97D weighs 2,670 and the 98 D weighs 2,706 pounds.

Wheel Base—*Over all length of chassis instead of wheel base, which manufacturers refuse to give. **Essex, seven-passenger sedan available on 119-inch wheel base.

Engine Make—Con. Continental; Lyc. Lycoming, Hall, De Vaux-Hall Motors Corp.

Thermostat—Bish-Bab. Bishop & Babcock; Dole, Dole Valve Co., Chicago, Ill.; Ful Fulton Co.; Pines, Pines Winterfront; Var, various makes.

Valve Arrangement—L, L head; H, horizontal; O, overhead; K, sleeve valve; LV, V-type L head.
*Air cooled. †Thermo syphon water circulation.

Compression Ratio—*Optional on the Auburn.

Piston Material—*Alum, aluminum with invar struts; Alum, aluminum alloy; CI, cast iron; S St, semi-steel.

Oil Purifier—Pur, Purolator; Wal, Wall; Han, Handy; AC, AC Spark Plug Company; Ste, Stewart-Warner; Ski, Skinner; Flo, Floato.
*Using both Floato & Skinner.

Fuel Cleaner—AC, AC Spark Plug Co.; Gas, Gascolator; Ste, Stewart-Warner; Til, Tillotson; V-S, Van Sicklen.

Carburetor—Sch, Wheeler Schebler; Zen, Zenith; Mar, Marvel; Car, Carter; Str, Stromberg; DL Detroit Lubricator; Til Tillotson.

Air Cleaner—AC, AC Spark Plug Company; AM, Air Maze; Han, Handy; Un United; Til, Tillotson.

Front End Drive—Link, Link Belt; Tex, Texolite; Cel, Celeron; Diam, Diamond Chain; Morse, Morse Chain Company; Var, various makes of chains; Var-G, various makes of gears.

Ignition, Generator and Starter—Aut-L, Auto-Lite; Del-R, Delco-Remy; Dyn, Owen-Dyneto Corp.; N E, North East.
*Nash,—Indicates twin ignition.
*Bendix starter used.

Clutch—Borg, Borg & Beck; Br-L, Brown-Lipe; Rock, Rockford Machine; Long, Long Clutch Company; Rus, Russell Mfg. Co.

Transmission Make—D, Detroit Gear; WG, Warner Gear Company; M, Muncie Gear Company; O, Own; N, New Process Gear Corp.; W, Warner Corp.
*Franklin Transcontinent models are equipped with both Warner and Detroit 3 or 4 speed gear sets, according to body type.

Transmission Type—DG, Detroit Gear & Machine Co.; LGS, The LGS Corp.; F, Free Wheeling; SM, Synchro Mesh; BW, Borg-Warner; NP—New Process Gear Corp.

Universals—U, Detroit Universal Products; S, Spicer Mfg. Corp.; O, Own; M, Mechanics Universal Joint Company.

Rear Axle—Col, Columbia; Sal, Salisbury; Tim Timken; N.P., New Process Gear Corp.; ½-Semi-floating; ¾-¾ floating; F-Full floating.

Ratio—Optional on the Auburn. *On Pierce Arrow 43, 137 in W. B. rear axle ratio is 4.42. On model 41 rear axle ratio is 4.42. On model 42 ratio is 4.23.
†The axle ratio varies with body types on Franklin models.

Brakes—H, hydraulic; M, mechanical; SD, steeldraulic; Bendix, Bendix Brake Corp.

Steering Gear—Gem, Gemmer; Ross, Ross Gear and Tool Company; Sag, Saginaw; Say-B Saylor-Beall Manufacturing Company; War, Warner; N.P., New Process Gear Corp.

Rear Springs—S, semi-elliptic; El, full elliptic; Cant, semi-cantilever; S-Tr, semi-transverse. *Rear spring length on Willys, 6-98D is 51 in.

Spring Shackles—Tryon, Willys-Morrow Company; Rub B, Rubber Shock Insulator Company; Faf, Fafnir Bearing Company; ERS, Eaton Rubber Bushings; Inlox—Inland Mfg. Co.

Chassis Lubricator—Alem, Alemite; Al-Z, Alemite Zerk; Bijur, Bijur Lubricating Corp.; Far, Farval.

CAR MAKERS BUYING ON SIX MONTHS' BASIS

Pontiac, Nov. 2. — Automobile manufacturers placing orders with local accessory factories are now specifying purchases covering six-month periods, whereas formerly they covered only thirty days. A growing realization that the present time is the best buying market is indicated by Victor E. Nelson, president of the Universal Oil Seal Company here.

An order was received by the local factory this week from Chrysler Motor Car Company covering the purchase of oil seal rings for six months, with the option of extending the order to July 1 at the same prices. Formerly orders from this company had been placed for only thirty days in advance. The Chrysler company, together with other manufacturers, is starting a trend toward return of business, Mr. Nelson believes. The Universal Oil Seal Company is now operating on a full fifty hour week for all employees.

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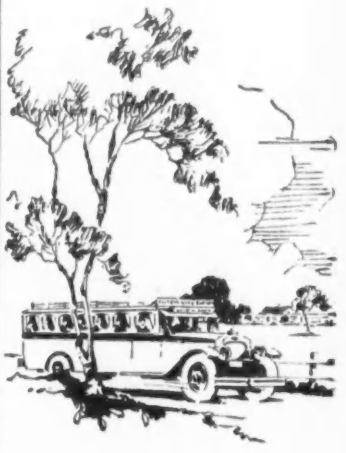
AMERICA'S STANDARD



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"Accuracy" has been the cornerstone on which Continental has built success. For 30 years the solutions of the individual problems of Continental clients have been the results on which Continental's reputation as an institution has been based.

This same accuracy and close working interest in individual client's requirements characterize Continental today.

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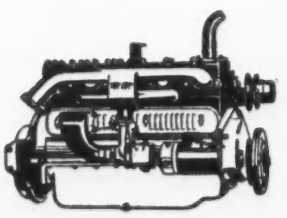
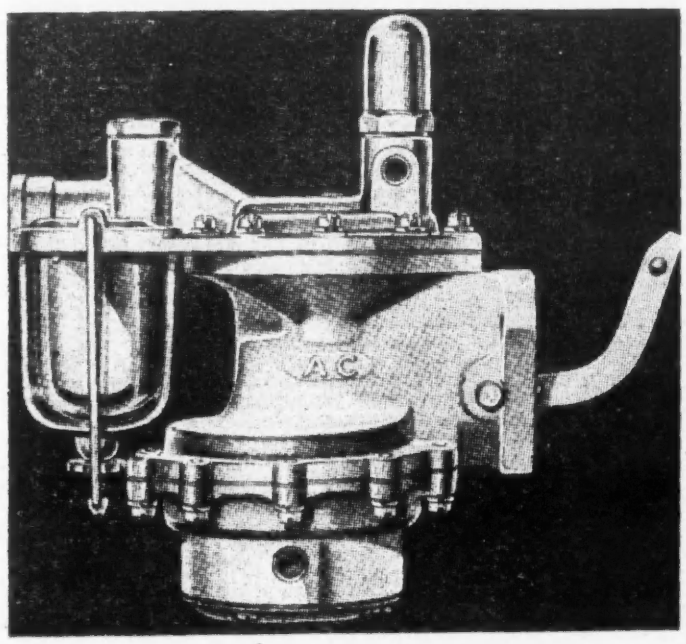
Factories: Detroit and Muskegon



Continental Engines

Production - - Engineering - - Factory

A. C. Device Prevents Windshield Wiper Stalling



A device which eliminates slowing or stalling of the windshield wiper during hill climbing or rapid acceleration has been developed by the A. C. Spark Plug Company, Flint, Mich. The new device is in combination with the A. C. fuel pump and is said to keep the windshield wiper operating at a continuous rate under all conditions.

It provides a vacuum as high as 17 degrees of mercury, depending on the spring compression, insuring ample power for operation through sleet or snow. The combination is installed economically as a single unit for drive from the engine camshaft, it is stated.

It necessitates no changes in the wiper itself. It is available in two sizes to take care of any fuel or vacuum pump requirements. New car models by several leading manufacturers will be factory equipped with the new A. C. combination fuel and vacuum pump, the makers state.

DALL ANNOUNCES THREE NEW ITEMS

Dall Motor Parts Company of Cleveland, O., announce three new lines which will be exhibited at the N. S. P. A. Show.

These will include a complete line of connecting rod bushings, a complete line of piston set screws, and a line of sleeve assemblies for sleeve motors. The last item is the cylinder sleeve for the sleeve motor which will contain in the unit (in addition to the cylinder sleeve) the piston pin, and the piston rings, all set up and ready to go right into the motor.

Samples of these three new lines will be available at the show, as well as price lists and catalogues featuring them.

STARRETT ADDS NEW TYPE FEELER STOCK

A new type of feeler stock designed for added convenience and economy is now being manufactured by the L. S. Starrett Company, Athol, Mass. The new stock, known as No. 667, is prepared and packaged in 12-inch lengths, each piece being marked with its thickness and having both ends carefully rounded so that no sharp or ragged edges can occur. The Starrett Feeler Stock No. 667 is made in 12 popular thicknesses as follows: .0015, .002, .003, 004, 005, 006, 007, 008, 009, 010, 012, and .015.

The new form is reported to be especially popular in the automotive field where Starrett Feeler stock in longer lengths has already been used for several years. Manufacturers, large service stations and the service shops of fleet owners that have replaced the conventional thickness gage with the feeler stock find the handy 12-inch lengths particularly convenient.

The 12-inch lengths are commonly used in conjunction with the Starrett Feeler Gage Holder No. 806, a device which permits the strip to be withdrawn as it is used and prevents cuts and scratches.

To prevent the stains and rust spots which might result from handling, each piece of Starrett Feeler Stock No. 667 is contained in an individual envelope, each envelope being marked on the outside to show the thickness of the piece enclosed.

LITLE ADDRESSES DAYTON SECTION S. A. E.

Dayton, Ohio (UTPS).—T. J. Litle, Jr., vice president and general manager of the Grolan Manufacturing Company, spoke October 27 to members of the Dayton section, Society of Automotive Engineers, at their meeting at the Engineers Club here.

Litle, who recently came here from Detroit where he had been associated with Henry Ford and other prominent manufacturers talked on the subject, "The Automobile a Few Years Hence." William B. Stout, president of the Stout Engineering Laboratories, Inc., Detroit who was scheduled to make the address was unexpectedly called to California on business. His talk has been postponed, however, for the December meeting.

New Rex Moto-Mixer Equipped With Hoist

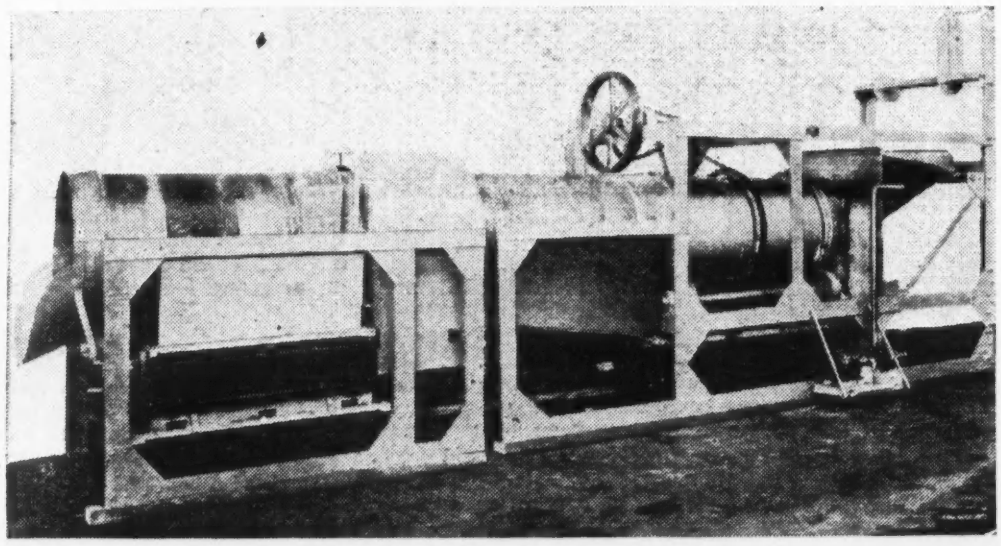
A new hoist for truck mixers, called the Jackass Hoist, has been developed by the Chain Belt Company for their line of Rex moto-mixers and moto-agitators.

This new hoist arrangement raises the mixer eight feet from the ground for a greater delivery and spouting range. The hoist was developed with the co-operation of the Heil company of Milwaukee, manufacture of the Heil hoist. It is a hydraulic hoist fitted to the rear end of the truck chassis and raises the discharge end of the mixer just like a jackass raises his heels to kick. The Heil hoist used has been especially designed for this mixing unit. The lifting effort is exerted directly against the load to raise the drum the desired height. The cost of the concrete in the forms is often cut from 25 to 50 per cent.

From the height of eight feet the concrete can be spouted over an area approximately 75 per cent. greater than heretofore. Sidewalks can be poured across parkways without wheeling. Building foundations and walls can be chuted even when the truck cannot get within ten to twenty feet of the hole. Alleys and streets can be fanned their full width. The hoist raises the drum high enough to discharge into a three-yard hopper. The flow of concrete can be regulated easily by the operator from a slow trickle to a full discharge by a simple turn of a handwheel.

Though the mixer is raised at a considerable angle, the drum empties itself cleanly and thoroughly.

New Rotary Pickling Machine



This equipment produced by N. Ransohoff, Inc., Cincinnati, O., consists of several connected sections. The first of these is the pickling drum, which is lined with Goodrich Rubber Company's Triflex rubber ⅜" thick vulcanized to the shell. The work is brought to this drum in standard tote boxes and charged into it by a crane or the machine may be equipped with a power loader designed to accommodate standard tote boxes. This drum rotates at 6 r. p. m., gently agitating the work in a flowing bath of sulphuric acid. This agitation is gentle enough to permit the handling of soft threaded work in the machine without danger of marring. The acid is pumped into the drum from a lead lined tank located beneath it and drains back into the tank. This tank projects on one side of the machine and is so shaped that the accumulated sludge and scale can be readily removed from it. The work is retained in this rotating drum until the pickling is completed. Reversing the direction of the rotation discharges the work through a spiral head of patented design into a continuous screen made of acid resisting metal. In the first part of this screen, the work is drained and in the second it passes under a spray from city water lines. After this thorough rinse, it is drenched with a fluxing solution of zinc chloride or muriatic acid. It is then discharged from the end of the screen onto the hot plate for drying. The machine can be furnished with a final drying screen, so that the work will be delivered pickled, fluxed and dried, ready for galvanizing.

M. & S. HI-SPEED FORD DISTRIBUTOR CAM

A new item of interest to the trade is the M. & S. Hi-Speed Distributor Cam for Model A and AA Ford cars, made by Martin & Stoner, Chicago.

This speed device is designed to give from two to six more miles per hour and much snappier getaway in first and second gears.

This device is intended to cause the breaker points to open and close more sharply, increasing the efficiency of the current by allowing points positively to close for a greater period. Consequently, time is allowed for a sufficient current to build up in the condenser.

The M. & S. Hi-Speed Distributor Cam can be installed in two minutes. It simply replaces the regular distributor cam.

TRIPLEX PRODUCTION, SALES HIGH IN OCTOBER

New York, Nov. 2.—Production sales and shipments of the Triplex Safety Glass Company of North America during October will apparently exceed those of September by a satisfactory margin. Figures for the month are incomplete as yet, but a maintenance of the present rate will insure an October in-crease.

One of the noteworthy features of the current business situation of this company is the remarkable increase in sales by distributors in the field. As far as it can be traced, this is due to the increasing public desire to replace the ordinary glass in their cars with safety glass.

NEWARK A. S. S. T. HOLDS ANNUAL SESSION TODAY

Newark, N. J., Nov. 2.—The American Society for Steel Treating will hold its twenty-sixth meeting tomorrow with a dinner at the Washington Restaurant. Gregory J. Comstock, director of the research for the Firth Sterling Steel Company, McKeesport, Pa., will give an illustrated talk on the processes and equipment employed in manufacturing cemented hard carbide materials. Dinner will be at 6 o'clock. At 8 o'clock motion pictures, "Walls Without Welds" and Cemented Tungsten and Tantulum Carbides" will be shown by Mr. Comstock.

There will be a special exhibit by the Crocker Wheeler Manufacturing Company.

RECEIVER APPOINTED FOR AJAX RUBBER CO.

Racine, Wis., Nov. 2.—A letter to bondholders from the protective committee for the first mortgage fifteen-year 8 per cent. sinking fund bonds of the Ajax Rubber Company here announces that L. T. Vance has been appointed general receiver for the company. Mr. Vance was vice-president of the firm. With a view to finding some buyer for the properties, the receiver is to conduct an extensive survey, upon the completion of which the protective committee hopes to be in a position to decide whether the property should be sold without delay or held for a time in the hope that more favorable terms could be obtained.

Are You Using Modern Methods in Your Business

Vital changes take place and often we are too close to the changes to appreciate them. Some of us grow old, with old traditions, old ideas, old methods—particularly selling methods. Amplification of basic principles has brought us television, radio, immense bridges, buildings 100 stories high and business news by the day.

Business men, who make big purchases want business facts. They read Automotive Daily News because it is a business paper, a fact paper, it gives news by the day in keeping with the tempo of modern business. Advertise to them where they can SEE your selling message no matter what size.

Here are some examples of business facts for automotive business leaders given to them during the PAST week in the issues of Automotive Daily News.

STORY	*In Automotive Daily News Delivered to Most Subscribers on Date Shown*	*In Other News Publications Delivered 1 to 3 Days Later Than Dates Shown*
Car Makers Agree on Standard Warranty; Owner Service Policy	October 27	October 31
Auburn Adds New Speedster	October 27	October 31
Austin Introduces "Free Motoring"	October 27	October 31
Pierce-Arrow Forms New Sales Divisions	October 27	October 31
S. A. E. Transportation Meeting Papers	October 28	October 31
Reeves of N. A. C. C. Outlines Trade Association Duties at Columbia	October 28	October 31
Members Approve M. E. A. Revisions	October 29	October 31
Alger Resigns from Durant	October 29	October 31
Duesenberg Adds Transformable Phaeton	October 29	October 31
Willys Reports Sales Gains	October 29	October 31
Official September Production Figures	October 30	October 31
Mexico Revises Tariff Rates	October 30	October 31
Plymouth Cops First Place in Five Cities	October 30	October 31
Nine Months' Passenger Car Sales By Makes and States	October 31	Not yet
October Output Estimated at 90,000	October 31	Not yet
Bendix Nine Months' Earnings Top 1930	October 31	October 31

The above are representative examples.
More if you want them.

Automotive Daily News

H. A. TARANTOUS, *Business Manager* 350 HUDSON STREET, N. Y. C.

DETROIT OFFICE: Geo. M. Slocum, Manager, Fisher Building, Detroit, Mich.
WESTERN OFFICE: Willard R. Cotton, Manager, 333 No. Michigan Ave., Chicago, Ill.

1931 Passenger Sales Put at 1,889,627 Units

(Continued from Page 1)

that the zones maintain a surprising regularity in sales:

	1st Quarter	2d Quarter	3d Quarter
New England	6.69	10.14	8.73
Mid-Atlantic	21.60	25.46	25.47
East No. Central	22.86	23.34	21.47
West No. Central	14.06	11.12	10.80
South Atlantic	10.60	10.01	11.43
East So. Central	3.51	3.78	4.04
West So. Central	7.07	5.68	6.26
Mountain	3.19	2.74	2.71
Pacific	10.42	7.73	9.09

The same regularity is disclosed in a regional analysis of commercial car sales totals.

According to some authorities, an upturn in business conditions will be heralded by an increase in the percentage of the Middle Atlantic states. If this is sound the change from 21.6 per cent. to 25.46 and 25.47 per cent. is at least not discouraging.

During the three quarters, sales of new passenger cars were divided between the three price class groups as follows:

	First Quarter	Second Quarter	Third Quarter
Low	73.3	74.1	74.6
Medium	24.1	23.7	23.0
High	2.6	2.2	2.4

Complete reports compiled by the Polk Company show sales of new commercial cars aggregating 25,967 units in September, 1931, as compared with 33,933 units during the same month in 1930, and with 27,070 units during August, 1931. The declines shown are 23.5 per cent. and 4.1 per cent. respectively.

Total commercial car sales during the three quarters of the year were 260,469 units, as against 335,785 units during the same nine months in 1930, a decline of 75,316 units, or 22.4 per cent.

STEEL PLANTS GAIN SLIGHTLY ON CAR ORDERS

(Continued From Page 1)

demands for their products has come.

The gain, while small, brought district operations to 31 per cent. of capacity, the highest rate in five or six weeks, and a gain of 1 per cent. from schedules last week. Against operations two weeks ago, the current mill average in the valley shows a gain of 6 points.

Part of the gain is due to slightly greater taking of steel automobile parts makers, although buying from this source has not yet developed to the degree anticipated. November is expected to bring more automobile steel specifications. Demands for steel going into rims, brake drums and other shapes are said to be rising, but sheet buying has tapered slightly. This trend, it is expected, will be quickly turned, since preparation of 1932 models will require car makers to increase their buying of sheets and strip within the next four of five weeks.

A Youngstown district company producing a large share of its products for the automobile industry is responsible for recent increases in the district ingot-making rate. Republic Steel Corporation this week lifted its steelmaking activities at Warren, O., to 60 per cent. of capacity, a gain of more than 10 per cent. from last week. Part of the increase will go to the company's strip mills at that point.

In addition to lifting its output of flat steels Republic shows a slightly higher rate of pipe production with two electric weld mills under power, against only one a week ago. Pipe manufacturing in valley mills, which specialize in tubular goods, is at an extremely low level, although the current week shows a small increase.

Eight sheet mills at the Youngstown Sheet and Tube Company's Campbell plant will resume production on November 11 or 12, according to present plans. For the last three or four weeks sheet production for this ecompany has shown little change, its automobile industry and other customers for sheets showing little change in their requirements.

Carnegie Steel Company operations in the district are holding at 40 per cent. of capacity, unchanged from last week. Shipments to automobile plants continue to form an important part of Carnegie's valley business. Six of fifteen open hearth furnaces were expected to be melting this week.

Sharon Steel Hoop Company production is continuing on a 20 per cent. basis, with one of six open-hearth furnaces melting. Strip and sheet mills are operating irregularly for this company which should immediately reflect a genuine increase in the rate of automobile steel buying.

PLAN STRINGENT RULES FOR TRUCK INTERESTS IN MASS.

Boston, Mass., Nov. 2.—Railroads in this state should not be further burdened by regulations or taxation, Chairman Henry C. Atwill of the state Department of Public Utilities said here. Atwill was called to testify before a special legislative commission investigating the question of regulating motor trucks used as common carriers.

The hearing was also featured by a prediction by Alfred W. Devine, assistant to the registrar of motor vehicles, that, eventually, drivers of motor vehicles will be subjected to mental examinations before they are licensed. This statement came after evidence was introduced to the effect that railroad engineers are subjected to severe tests.

Most of the session was given over to evidence tending to show the difficulties of attempting to regulate common carriers and private trucking concerns. At the conclusion of the session, Senator Newland H. Holmes, chairman of the commission, announced that the session would be resumed on Thursday, November 12, at which time it was expected that President James Pelley of the New York, New Haven & Hartford road would probably be present.

Day Baker, representing the motor truck interests of the state, offered a lengthy statement furnished by Dr. Julius H. Parmalee, director of the Bureau of Railway Economics, before the Interstate Commerce Commission at Washington, tending to show that motor trucks can handle but a small percentage of the carrier business as compared to that carried by railroads, even though all trucks now in existence were put into use at once.

Chairman Attwill was subjected to examination by several members of the commission for nearly an hour. He said he had never received any complaints that local railroads had violated their tariff. Attwill's statement that railroads were already burdened enough with taxes came early in the session while he was discussing tariffs, under questioning by William P. Libbey, one of the governor's appointees to the commission.

"Perhaps the state is not liberal enough with the railroads, he said, "there are now too many taxes of all kinds, without adding any more."

Attwill added that he thought railroads should be allowed to enter into the "door to door" transportation business and that they should be allowed to add extra charges where they operated spur tracks or switches for the benefit of the public.

The chairman, discussing regulation of common carriers, said such legislation would cause considerable trouble in that it would call for some agency of government to enforce the new rules. Attwill said it would be difficult to differentiate a common carrier from a private truck or contract carrier and that many would claim to be either one of the latter two mentioned.

"I hope they don't place the baby on our doorsteps," he said, with reference to enforcing the provisions of proposed legislation.

TIRE STOCKS OCT. 1 IN DEALER HANDS ON PAR WITH 1930

(Continued From Page 1)

tubes were 80.8, as compared with 89.2 a year ago, while 19.1 solids, etc., were carried, as compared with 22.7 in October, 1930.

High pressure casings, including both passenger car and truck sizes, which accounted for 17.37 per cent. of total stocks reported October 1, 1930, amounted to only 13.09 per cent. of the total reported this year.

In comparing inventories with those of previous years ranging back to 1924, it is seen that average stocks increased regularly, except for 1926, until 1929, since when they have declined. The average stock of inner tubes began to decline a year earlier than for casings and the contractions have been more pronounced. Current dealers' stocks of inner tubes average nearly the same as in 1924, but the current ratio of tubes to casings is much lower than in 1924. Stocks of solid and cushion tires have shown a gradual downward trend throughout the entire period. The decline in stocks of casings since 1929, follows naturally the lower volume of renewal tire sales in the past two years, while the even greater decline in inner tube average stocks follows the reduced ratio of inner tube sales compared with casings sales.

A geographical survey of the stocks of independent dealers shows that stocks are relatively high in New England, the South Atlantic and Pacific states, and relatively low in East, South Central and West South Central states. Inner tube stocks are relatively low in the East, South Central states this year.

Dealers continue to tend to largely concentrate their efforts on one or, at the most, two makes of tire. Dealers handling only one make of tire comprise 70.47 per cent. of the group, while dealers handling two makes are 23.68 per cent. of the total.

It thus appears that dealers handling either one or two makes of tire comprise 94.15 of a total that also includes 4.08 per cent. of dealers carrying three makes, 1.24 per cent. handling four makes, 0.32 per cent. selling five makes and 0.21 per cent. dealing in six makes.

This tendency to concentrate on a single make is especially impressive when figures from 1925 are surveyed. In that year only 41.6 of dealers carired one brand of tires, while 36.5 handled two makes and 15.1 dealt in three makes.

Analyzing casing inventories by volume groups it appears that 1931 stocks show a greater percentage of reports falling into the class of dealers having less than twenty-five casings in stock, and a smalled percentage of dealers carrying twenty-five casings or more in stock, with the exception of that group having 1,000 casings and over, whose percentage of the total increased slightly from last year.

Over 77 per cent. of the total reported stocks of casings were held by 26 2-3 per cent. of the dealers.

The percentage of dealers who engaged in either the selling of automobiles, gasoline or batteries in addition to their tire business increased considerably over last year. A group of 38.7 per cent. sold automobiles as compared with 34.9 in 1930. Those selling gasoline were 80.4 per cent., as compared to 74.5 in October, 1930. Dealers selling batteries comprised 72.1 of the total, as compared to 65.3 in October, 1930.

PACIFIC HARD RUBBER TO BUILD NEW PLANT

Los Angeles, Nov. 2.—Pacific Hard Rubber Company has been organized here as a subsidiary, wholly owned and controlled by the Stuaffer Chemical Company, for the manufacture of hard rubber storage battery containers. The new plant and equipment will represent an investment of $100,000. A factory will be built at 3200 East 26th St., according to John Stuaffer, Jr., and will employ fifty men at the outset. Construction work is expected to start in November and the plant will be ready for production in February. The plant will occupy a one-acre site.

Newark, N.J., Louisville, Ky. Report Employment Gains

(Continued From Page 1)

of labor, by Russell J. Eldridge, state director of employment.

Despite the increase in employment, total earnings of the workers fell 5.8 per cent. under the total of the month before, the report stated, while the weekly earnings of an average worker fell from $25.20 to $23.65 or 6.2 per cent.

In September the public employment bureaus under the Labor Department's supervision placed 45.6 per cent. of the applicants, as compared with 53.2 per cent. in the same month a year ago. In the year ending September, 1931, the percentage of placements was 47.4.

The Newark Municipal Employment Bureau failed to furnish its record for the September report, though it usually has done so before.

The state Labor Department issues a monthly statistical survey of industrial conditions in New Jersey. This is the basis of the regular survey of conditions made periodically by the United States Employment Service, which is represented in the state by Phillip Stevenson, state director of Federal employment.

The state department's report showed there were 203,738 persons employed in the 774 plants as of September 15, against 203,202 as of August 15. These drew a total weekly pay roll of $5,116,846 as of August 15 and $4,817,445 as of September 15.

The Newark and Harrison area contained the largest group of plants reporting 258. In these employment rose six-tenths of 1 per cent., the total weekly earnings fell 4 per cent. and the average workman's weekly wage fell from $25.37 to $24.22, or 4.5 per cent.

Although only 109 plants reported in the Jersey City-Bayonne-Kearny group, and the number of employees was less than in the plants of the Newark-Harrison group, the total paid in salaries was greater than in the Newark-Harrison plants.

However, the total of the Jersey City group fell 6.3 per cent. under its total of a month before, while an average workman in one of these plants was drawing $28.36 per week, as compared with $29.68 a month before, the decrease being 4.4 per cent.

The greatest increase in employment was in the Bound brook-Somerville group, where the rise was 9.1 per cent. Payroll totals increased 3.3 per cent in this group but the average weekly wage fell 5.3 per cent.

Passaic and Garfield plants showed the heaviest drops in total weekly pay rolls and in the average weekly wage. This was 20 per cent. for the total pay roll and 15.3 per cent. for the average wage of a single workman. Employment in this group fell 5.6 per cent.

Classified as to types of industries, the largest group consisted of plants manufacturing textiles and their products. The 157 plants in this group reported that employment fell 1.7 per cent. during the month, the total pay roll fell 9.8 per cent., and the average weekly wage of a single workman fell from $22.58 to $20.71 or 8.3 per cent.

Of the iron and steel and similar plants, 153 reported. These showed an employment drop of 2 per cent., a total pay roll drop of 6.7 per cent. and an average weekly wage drop of 4.8 per cent. A month before an average workman in one of these plants received $26.06 a week, but was receiving only $24.81 as of September 15.

The industry reporting the highest increase in employment was that manufacturing radios, which was employing 23.2 per cent. more persons than the month before. Total pay rolls in these nine plants increased 7.8 per cent. but the average workman was receiving 12.5 per cent. less a week.

LOUISVILLE, KY., REPORTS 10% EMPLOYMENT GAIN

Louisville, Ky., Nov. 2.—A gain of 10.2 per cent. in employment in September as compared with August and a gain of 20.3 per cent. over June, is showing in a report made by W. E. Morrow, secretary of the Louisville Board of Trade, for seventy-two reporting plants in Louisville. The September gain was accounted for by increased employment in tobacco manufacturing, bedding and canning plants chiefly.

He claims that first signs of an upward trend came in July, when 1,509 workers were added, as compared with June, a slight slump was shown in August, but 1,142 were added in September. In January the seventy-two plants had 10,749 workers employed; February, 10,884; March, 11,142; April, 10,901; May, 10,769; June, 10,182; July, 11,691; August, 11,112, and September, 12,-254.

Of the seventy-two plants reporting for September, twenty-eight reported increased numbers employed; twenty-one reported no change, and twenty-three showed decreases.

ST. LOUIS SECTION S. A. E. ELECTS NEW OFFICERS

St. Louis, Mo., Nov. 2.—The Society of Automotive Engineers, St. Louis Section, has elected the following officers:

Chairman, George M. Stevens, branch manager Diamond T. Motor Car Company; vice-chairman, George P. Dorris, sales engineer Sterling Products Corporation; treasurer, Robert M. Pease, manager St. Louis factory, Axelson Aircraft Engine Company, and secretary, William G. Jenkin, president Jenkin-Guerin Oil Company.

KISSEL MOTORS SALE POSTPONED TO NOV. 23

Hartford, Wis., Nov. 2.—The receivers' sale of the Kissel Motor Car Company properties in this city, scheduled for October 27, has been postponed to November 23.

SPARKS *from* DETROIT

(Continued from Page 2)

have been wool-gathering, for North East is standard equipment on fifteen different makes of cars at the present time.

* * *

VISITORS to the Fisher building, in which the Detroit office of A. D. N. is located and where "Sparks" is generated, gamble when they call, if the come by automobile. There are two Fisher parking lots, one on each side of Second Boulevard. One charges ten cents an hour and the other twenty cents flat for all day. If it is a short call you save money by using the ten-cent lot, but one of my callers the other day found me so gabby that when he picked up his car there was a forty cent charge, twice what it would have cost him on the other lot. That's where the gamble comes in.

* * *

ONE of the great army of Detroit unemployed was picked up by the police charged with catching and eating Grand Circus park pigeons. The poor chap was too proud to beg so he had been going to the railroad yards to pick up corn with which he lured the pigeons which furnished him food and kept him from starving. He was not punished, however.

Relation of the Motor Coach Body to the Chassis

This paper was presented before the Thursday session of the S. A. E. transportation meeting at the Hotel Shoreham, Washington, D. C., last week.

By R. W. NAEGEL
Bender Body Company

THE body's relation to the chassis has several phases—it must have rider appeal, comfort, appearance and safety. To the majority of riders the body is most important, as it has the greatest influence in sale of rides and helps to make or mar the vehicle as a whole.

It must be constructed so that the operator can meet the demands of the rider at a minimum of maintenance cost. The rider has been the dominating factor. He has demanded more comfortable, better appearing and safer coaches. This demand has been the direct cause for many changes in designs. However, the design is becoming standardized into three types: the convential city coach, the Intercity coach with interior overhead luggage compartments and the Metropolitan type coach.

This standardization makes the relative life of the body to the chassis one of the most, if not the most, important factor of the motor coach.

Maintenance on the present day bodies will determine whether or not the bodies will last for the life of the chassis. The chassis has a very definite advantage over the body in that the vital parts, engine, axle and transmission can be repaired or replaced and, with modern maintenance methods, be as efficient as a new unit. This gives the chassis an indefinite life, depending only on the operator to determine when the unit shall become obsolete.

The body is a different problem. The vital parts cannot be replaced as easily as those of the chassis and consequently they are repaired to maintain appearance, and often when improperly repaired the original strength is impaired, causing the failure of connecting parts. This method has shortened the life and increased the maintenance cost of the body.

In the composite body, steel is being used in the underframing and metal reinforcements have been added to the superstructure to increase the life and strengthen the unit parts, and make it possible for the operator to repair the vital parts of the body and still retain practically the original strength.

The metal body has advantages over the composite type in certain kinds of service. Metal is not affected by climatic conditions as readily as wood, and it is possible to maintain more uniform strength due to the nature of the material. Parts are easily removed or replaced and connecting parts are not affected by this replacement. In cases of accident, the metal body is bent and distorted, but does not splinter and break.

The relative strength of the body and chassis has been very carefully considered by both chassis and body engineers. If we assume a body of either composite or all metal construction having strength equal to that of the chassis upon which it is mounted, the body would be several times stiffer than the chassis due to the differences in the depth of the section. The difference in deflection and the twisting action of the frame has caused loosening in the joints of the body framework. The result has been the failure of the body and the points most noticeable are through the wheelhouse and at the front end.

The steel-framed body presented an entirely different problem than the composite. The difference in stiffness instead of loosening the body framework broke the attachments to the frame, and in some cases of the earliest type steel bodies caused the chassis frame to break.

To overcome this action, the mounting of bodies has been changed. Outriggers—if outriggers are used—are located at points on the chassis having the least amount of deflection or distorting action. The use of cross-member moun ng, in the writer's opinion, has been most successful, as it gives the chassis freedom to move without the possibility of the twist in the chassis side rail being arrested or transferred to the body.

The relative weight of body and chassis is very interesting. Body frame including roof, floor and exterior paneling, equal 17.87 per cent. of the total weight of the bus. Body trim and miscellaneous equipment such as rear bumpers, spare tire carrier, equal 12.08 per cent, and seats equal 8.75 per cent., making a total for the body of 38.60 per cent. and a total for the chassis of 61.40 per cent. This estimate was made for an intercity coach. The per centage varies slightly for city type.

FRUEHAUF TRAILER MAKES TWO PROMOTIONS; MOVES ITS CHICAGO BRANCH

Detroit, Nov. 2.—G. W. Chamberlin, vice-president and director of sales of the Fruehauf Trailer Company, has just announced the appointment of C. L. Schneider as manager of the Fruehauf branch in Chicago. Schneider joined the Fruehauf company over fourteen years ago and has progressed through various departments, including engineering and sales, to his present position.

Chamberlin also announces a change in the location of the Chicago branch. This was formerly situated at 2711 South Wabash Ave. The new address will be Michigan Avenue at 29th Street and the telephone, Yards 2433.

Frank L. Tully has been named manager of the Fruehauf branch in Cleveland. Tully has been associated with the Fruehauf company since 1926.

Harry S. Moore, Tully's predecessor and for many years Cleveland branch manager, has been promoted in recognition of long service.

PUBLIC SERVICE STARTS WORK ON NEW TERMINAL

Fort Lee, N. J., Nov. 2.—Ground has been broken at Main Street and Abbott Boulevard, Fort Lee, by the Public Service, for its bus-trolley terminal. The terminal will occupy approximately 50,000 square feet, extending from Main Street south along Abbott Boulevard to Hoym Street. It will be utilized by the present trolley service and also as a junction for bus routes, and New Jersey traffic influenced by the new George Washington bridge.

E. D. BOTTOM NAMED FORD ATLANTA AID

Atlanta, Ga., Nov. 2.—J. h. Wood, manager of the Ford Motor Company's branch plant here, announce the appointment of Earle D. Bottom as assistant branch manager, P. A. Boykin as wholesale manager, R. E. Newsome, assistant wholesale manager, and W. W. Davis, head of the commercial department.

PLAN BUS SYSTEM

Ogdensburg, N. Y., Nov. 2.—The Ogdensburg Street Railway Company, a subsidiary of the St. Lawrence County Utilities, Inc., of which E. E. Wright of Malone, N. Y., is president, has plans in progress for abandonment of trolley car service in this city. Plans provide for installation of a complete city bus system to supplant the trolleys, operation of which is expected to begin early in 1932.

TODAY—

WHEN BUYERS CONSIDER VALUE

HUPMOBILE

RANKS AT THE TOP

Never before has the dealer been able to give so much for the customer's dollar.

Hupmobile offers its twenty-three years of experience in building fine cars . . . its traditionally high quality . . . the thrill of Free-Wheeling, plus its economy in operation . . . advanced style and appearance . . . luxurious comfort and appointments . . . and mechanical excellence of the first rank.

But, most of all, Hupmobile dealers know the truth of the factory's slogan:

"WE BELIEVE THE HUPMOBILE TO BE THE BEST CAR OF ITS CLASS IN THE WORLD"

HUPP MOTOR CAR CORPORATION · DETROIT, MICHIGAN

SPECIAL TRUCK FRANCHISE brings REO VAST INCREASE IN DEALERS

THE NEW 1½ TON $625 SPEED WAGON

Four-Cylinder $625, Six-Cylinder $725. *Chassis f. o. b. Lansing, Mich.* Dual Wheels $22 Extra

SPECTACULAR VALUES IN PASSENGER CARS

Reo passenger cars, too, afford Dealers an exceptional opportunity for year-round profits. The quality is extraordinary—and the prices spectacular.

Flying Cloud 6-21 . . .	$ 995	Reo Royale 8-31 . . .	$1985
Flying Cloud 8-21 . . .	$1195	Reo Royale 8-35 . . .	$2445
Flying Cloud 8-25 . . .	$1565	Reo Royale 8-52 (7 Pass. Sedan) . . .	$3695

Standard Model Prices—f. o. b. Lansing

LIKE a mighty skyscraper, Reo's Dealer organization continues steadily to grow, because the Reo Special Truck Franchise answers the most vital question of the hour—"How can I make money, this year and next?"

The Reo Special Truck Franchise is designed for these times and conditions. It enables passenger car dealers to *diversify their effort* and share in a business that offers a year-round opportunity for volume.

Reo truck sales since July are over 23% above the same period of 1930. That is because Reo has a superior line of trucks, a saleable line that literally commands the attention of buyers.

The amazing new 1½-ton Reo Speed Wagon alone has already changed the profit outlook for many of the 545 new Dealers who have joined Reo since July. Its superiorities are so easily pointed out to business men that the "mystery" of truck selling quickly vanishes and "prospecting" once more becomes a pleasure.

Are you looking for a supplementary line? Would you like to go to work on an account that gives such definite promise of real results? The opportunity in your territory may still be open. Mail the coupon and get the facts about the actual volume that you could expect in the next 12 months.

Reo Trucks and Speed Wagons range from 1½-ton to 4 tons. Prices $625 to $2800, chassis f. o. b. Lansing

REO MOTOR CAR COMPANY
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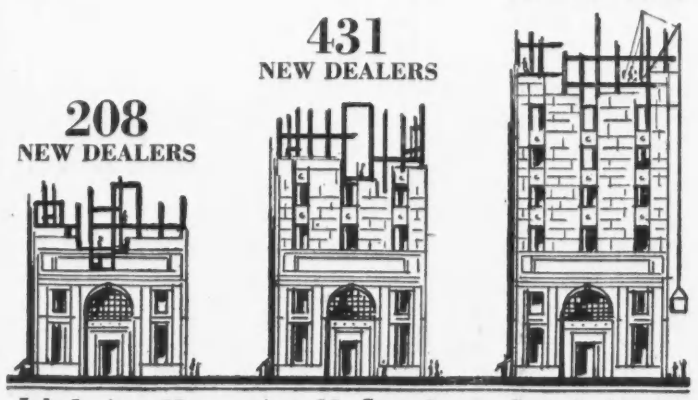

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